THE EFFICIENCY OF FUTURE CARGO SHIPS. See p. 244.
MOTOR BARGES FOR ISLE OF WIGHT SERVICE (Drawings). See p. 249.

SHIPBUILDING AND SHIPPING RECORD

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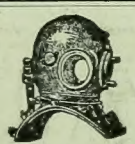

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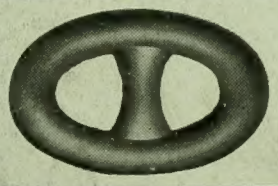

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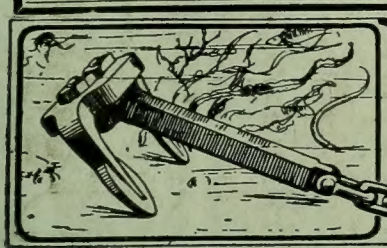

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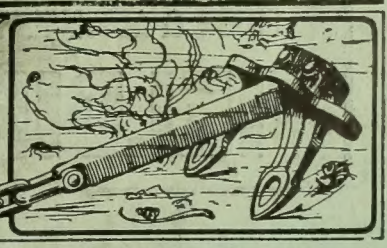

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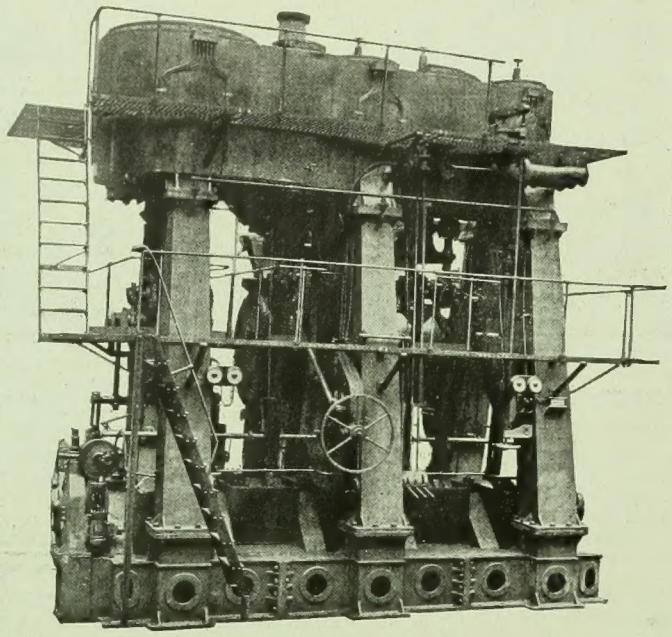

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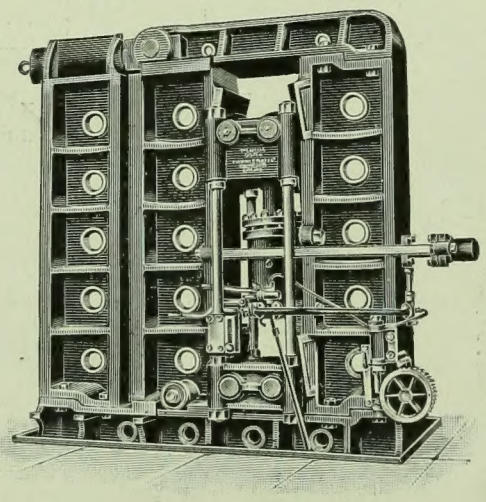

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MR. LLOYD GEORGE has the lawyer's gift of being able to see into the motives underlying human actions. At Birkenhead on Friday last, speaking in acknowledgment of the Freedom of the Borough which had been conferred upon him, he stated that the Germans realised that their hopes of success as a result of the submarine blockade were doomed to failure if the position as he gave it in the House of Commons recently was correct. Hence the frantic efforts which had been made by German statesmen and by the German newspapers to impress upon the German community the inaccuracy of these figures, both with regard to the losses caused by the submarines and to the efforts we are putting forth to construct new tonnage. Nobody in this country has ventured to doubt the accuracy of those figures except Mr. Lloyd George himself, who, referring to the figures he gave respecting the shipbuilding of the future, stated that their accuracy depends entirely upon the efforts put forth by all concerned in the production of these vessels. That this effort had been forthcoming in the past is proved by some remarkable figures given by Mr. Lloyd George as representing the shipbuilding activity of Birkenhead itself. Though the Mersey cannot claim to be the greatest of our shipbuilding districts, its importance being due more to its shipping activities, since the war began there has been turned out from its yards vessels of an aggregate of 700,000 h.p., which represents a not inconsiderable number of ships, and from the work in hand, the Premier is satisfied that "the contribution of Birkenhead is going to be as great as, or even greater, in the coming months of the year than it has been in the course of the past three trying years." This, of course, includes naval as well as mercantile tonnage, but if the activity of every yard in the country can be expressed as being three times as great as it has been since the war began, not only will the tonnage output of the country exceed the most sanguine expectations, but the supply of food and raw materials of this country is assured.

The Shipbuilding Output.

Notice ought to be taken now that the defence of compulsory pilotage will by statute disappear on January 1, 1918. Section 15 of the Pilotage Act, 1913, provides that "notwithstanding anything in any public or local Act the owner or master of a vessel navigating under circumstances in which pilotage is compulsory shall be answerable for any loss or damage caused by the vessel or by any fault of the navigation of the vessel in such manner as he would if pilotage were not compulsory." At the time when this Act was passed, it was contemplated that when this section came into force, an international code dealing with the limitation of the liability of shipowners would have been adopted. Such a code was practically agreed upon as the result of conferences carried on at Brussels. The war burst upon Europe, and this matter was relegated to the background. But if section 15 of the Pilotage Act is to take effect, it ought surely to be accompanied by the adoption of the code dealing with the limitation of liability. The Joint Committee of the Chamber of Shipping and the Liverpool Steam Ship Owners' Association in its report strongly recommends that the code should be adopted by Great Britain without waiting for action on the part of other nations. In view of all the circumstances, there is great force in the demand.

Compulsory Pilotage.

Underwriters are saying that the modern building risk is not remunerative, and quote figures to bear out their contention. It is certain that the premium is small, and that a certain number of minor accidents have recently caused claims which, when the premium is taken into consideration, appear formidable, but it is probable that an examination of the statistics of this class of business, taken over a large number of risks, would prove that where the Institute Building Risks were inserted in the policy, in their entirety, the profits were sufficient to make a continuance of accepting lines on vessels in any British yard desirable. The two units of the building clauses which seem to be least congenial to the assured, and therefore those which are most often asked to be deleted from the slip, are the value clause by which the insured value is stated to be the full contract value and is accepted as the basis of valuation from the inception of the risk, and the clause by which the Workmen's Compensation Act payments are excluded from the Protection and Indemnity Clause. It is obvious that the first is all in the underwriter's favour, since claims are adjusted on the full values at whatever stage of construction they apply, while the recent War Addition amendment to the Workmen's Compensation Act is sufficient alone to show a good reason for underwriters desiring to escape a liability to meet which special companies and clubs exist in ample sufficiency.

Are Building Risks Profitable?

The new conditions under which the Japanese War Risk Insurance Office is prepared to accept insurances on Japanese steamers is of interest to the London insurance market, since the facilities will be extended to foreign companies with branches in Japan who have written lines on Japanese steamers. The provision that the original rate must be lower than that of the Government Office seems necessary, since a certain profit without risk could be obtained if an insurance cheaper than the original risk were available, while

Japanese Government War Risk Insurance.

speculations in other directions will be avoided by the limitations to be placed on acceptances by a Committee to be appointed for that purpose. The chief interest, however, in this new departure seems to us to lie in the fact that by it a step is taken towards Governmental monopoly of war risk business. There has been discussion of our own War Risk Office making a move in this direction, though at the moment rumour alone seems to be responsible for the idea. There is no doubt, however, that the general trend of those Governments which are granting cover against war risk to their mercantile fleets is towards a complete control of this class of business.

The Shipping Committee's Report and Insurance.

Although practically the whole of the report of the Joint Shipping Committee is favourable to marine insurance, inasmuch as insurance itself must benefit by any measures that make for the betterment of our mercantile marine, there is one short paragraph which, if fulfilled, will prove of inestimable service to underwriters. The clause referred to is that dealing with repairs, and the preferential facilities which are suggested as desirable to be accorded to vessels flying the British flag, the suggestion being that for a period of two years after the cessation of hostilities the repairing facilities of the nation be reserved entirely for British shipping, except under exceptional circumstances. Now the bulk of a British underwriter's business is concerned with his country's own vessels, the proportion of foreign-owned steamers being practically limited by the ability of foreign markets to absorb, or otherwise deal with, their own tonnage. It is obvious that the better condition in which vessels are kept, the better they will be regarded as insurance risks, and therefore the sooner the large number of vessels at present running with unrepaired damage on board are once more brought up to their usual high state of efficiency, the sooner will underwriters benefit by the improved conditions under which these vessels will run. This train of events goes even further, for on a reduction of the hazards to which unrepaired vessels are undoubtedly subject, owners can look for a reflection in the lessening of the cost of their insurances, and thus attain a result which was certainly not contemplated when the restrictions clause was framed, but which is nevertheless a beneficial outcome thereof.

The Wooden Ships.

We have never been amongst those who have seen in the wooden ship a serious competitor to the steel cargo-carrying vessel, nor have we ever affirmed that it would be possible to rapidly build large numbers of motor-driven wooden vessels capable of withstanding the strain of frequent voyages across the North Atlantic, and in confirmation of our attitude there comes the important announcement that the United States Shipping Board has decided not to build any more of these vessels, but to confine new contracts to the construction of large and fast steel vessels. Wooden vessels already contracted for will be used in the coastwise trade so as to release steel ships for the transatlantic service. It will be remembered that upon the entry of America into the war, consequent upon the shortage of steel vast schemes for the construction of large numbers of wooden vessels were formulated, the vessels to be of about 3,000 tons displacement, propelled by oil engines capable of driving the vessels at a speed of from 8 to 10 knots. Plans were prepared, and despite a large amount of opposition from those who saw their limitations, contracts were placed by the Shipping Board for large numbers of these ships. The old wooden ships, however, were constructed of seasoned oak by men who were experienced in that kind of work, and they were often sheathed in copper, whereas at the present time the vessels must be constructed of green pine by men who have no experience of the intricacies of this kind of work, with the result that the vessels are found to leak badly when exposed to a rough sea. Hence, whilst it need not be assumed that the wooden vessels already constructed will not be of service in helping to meet the world shortage of tonnage, it is, we think, a wise step on the part of the United States Shipping Board to concentrate their attention on steel vessels for the more hazardous ocean services.

Mr. Hill and After-War Conditions.

In the course of his presidential address to the Trade Unions Congress Mr. John Hill said that he had failed to find anything useful in the Government's reconstruction proposals which could be applied to his trade, but he had found much that was calculated to fix permanently some of the restrictions and disabilities which had been accepted as a war measure. Mr. Hill's views on the subject of pre-war conditions, as they find expression in these words, are obviously rather vague, but if we read them aright, his statement is disquieting. It suggests, for instance, that the Boilermakers' Society has no intention of coming and going in any negotiations which may take place over the restoration of pre-war conditions. It is not denied that there is both a legal and a moral obligation completely to restore pre-war conditions. But it must be as clear to the General Secretary and Executive Council of the Boilermakers' Society as it is to the majority of the rest of us, that if there is complete reversion to pre-war conditions the United Kingdom's shipbuilding industry will be ruined. Take the alleged right to limit the number of apprentices as a case in point. The supply of skilled ironworkers which was inadequate before the war will be ridiculously inadequate when the hostilities come to an end. If Mr. Hill and his colleagues were wise they would now be striving to find solutions for that and other post-war problems instead of talking and writing in the uncompromising way which is their habit.

Sea Carriage of Goods.

Shipowners are naturally very much averse to direct State interference in the regulation of matters which have hitherto been satisfactorily conducted on the basis of free bargaining. Such, for instance, are the conditions under which goods are carried under bills of lading. The report of the Joint Committee of the Chamber of Shipping and the Liverpool Steam Ship Owners' Association insists strongly that the liberty of bargaining should remain. Certain mercantile interests, however, have been advocating a limitation of that liberty evidently under the impression that it would accrue to their own advantage. Impressed no doubt by the importunity of those interests the Dominions Royal Commission has recommended that legislation on the lines of the Harter Act should be passed in the United Kingdom. In other words, it suggests that whatever may be the circumstances and the sentiments of the parties to the contract of carriage, the shipowner by law should be unable to divest himself of liability for loss or damage arising from negligence, fault or failure in proper loading, stowage, custody, care or proper delivery of merchandise. What reason is there for interfering with a course of business which permits arrangements leaving the shipper to insure risks of all kinds ? The shipowner has the clearest business motives to exercise all reasonable and proper care. If he is to assume financial risks, he must certainly be compensated for them in higher freights. State interference with the details of straightforward honest contracts is not calculated to assist commercial dealings.

Repairers and Foreign Work.

The plea of some ship repairers that they ought not to be tied down to preference of British work for even a limited period after the war has, of course, something to be said for it. Many United Kingdom firms did a good deal of work for foreign owners in pre-war days, and they, no doubt, hope sooner or later to resume the old connections. Moreover, it is undeniable that if the volume of work offering is definitely reduced by making it incumbent upon repairers, where necessary,

to refuse foreign contracts, the capital of the firms engaged in operations of the kind will be less profitably employed than it would be with an open market. On the other hand, not only British shipowners, but the British public as a whole, are not to be denied the right to feel aggrieved if British ships have to lie idle while foreign ships are being put into condition by British labour and with British material to compete with them. During the war we have all hung together, and it is not too much to hope that in the reconstruction period we shall continue to be loyal to each other. From the point of view of the average man, who is neither a repairer nor an owner, the question, is, however, of less importance than from these other angles it seems to be. For a considerable time after the war there will be so much purely British work to do that a barring of foreign contracts will almost certainly have an inappreciable effect on prices. The only danger which is feared is that the period of exclusion may be made too long; but repairers may safely, we think, be left to see that that does not happen.

Standardisation.

The great defect of most of the extreme advocacy of standardisation is that it assumes merchant ships to be as easy to duplicate as motor cars. Ships, even comparatively simple cargo boats are, of course, much more intricate affairs, in the sense that in order to suit them for their employment—which is much less constant than that of a motor car—they have to be varied, especially in respect of their equipment. There are, however, extremists on the other side whose counter-advocacy is just as futile. In the Chamber of Shipping's recent report it is claimed, for example, that "in the last sixty years there has never been a period at which any part of the hull or equipment of a ship could, in the interests of safety, have been standardised." A good deal depends on what is meant by the words "in the interests of safety." But if the meaning is that no part of hull or equipment could be standardised with safety, we fear that a good many practical men will dissent from the view. Many things in and on ships could be standardised, and many, as a matter of fact, to all intents and purposes are. The Germans are, as we pointed out some time ago, getting out lists of parts which lend themselves to standardisation, and according to the latest accounts the catalogue is now a fairly long one. Our opinion is that even in the United Kingdom a good deal of this kind of standardisation will be practised after the war, and that even the conservative element in shipping and shipbuilding will see nothing objectionable in it.

Straight-Sided Ships.

The demand for the speedy and economical construction of ships has called forth endeavours to meet this demand for economy and acceleration. In one special direction the attention of shipbuilders is at present drawn, namely, to the adoption of straight-sided ships, and thus to save time and money now spent in the bending of frames. From the purely practical standpoint the idea is well worthy of consideration, but unfortunately the results of experiments with models having straight sides and square bilges indicate that the latter are conducive to high resistance. In the experimental tank at Michigan University Prof. Sadler has been investigating along these lines and has found that some radius at the bilge is highly desirable. Now, whilst economy in construction may be effected by the adoption of the square bilge, a constant outlay in higher costs for fuel through increased resistance would much more than counterbalance the initial saving. Some modified adoption of the idea may become practicable, and in certain ships now in service all the frames above the margin plate are straight, at least for a considerable portion of the vessel's length. It is a coincidence to find that when Prof. Sadler was experimenting in this direction, some other naval architects, in this country and also in America, were working on the same idea. It may be found possible to incorporate the advantages of straight sides and square bilges in some form of small resistance, but it is not extremely probable, since the square bilge interferes with stream-line flow.

Mechanical Stokers.

It is a significant fact that whilst the marine engineer has not been slow to adopt the various labour-saving devices that are employed by engineers on land, adapting them to suit the peculiarities of service at sea, he has not succeeded to any great extent in the employment of mechanical stokers. This is all the more to be wondered at when one considers their almost universal adoption on land installations of any size and the great success which has attended their use, a success due not only to the great reduction in the amount of labour required, but also to the far higher boiler efficiency obtained consequent upon the more even and more perfect combustion of the coal. Attempts have been made to adapt the mechanical stoker to the severer conditions of working which obtain at sea, but so far with little success, the chief cause of failure being due to its inability to withstand the effects of a rough sea. The present is not the time for experiments in directions such as these, the whole intellect of the nation is now directed to the solution of sterner problems; but it should not prove a very difficult matter to produce a mechanical stoker which could be successfully applied to the marine boiler, and with the return to happier conditions, attention directed to this problem should quickly reap a rich reward.

Water-Tube Boilers on Merchant Ships.

Whilst the water-tube boiler is now universally employed on naval vessels, the ordinary Scotch cylindrical boiler still maintains its supremacy in the mercantile marine. Shipowners object to the installation of water-tube boilers in their vessels chiefly on account of their unreliability and their lower evaporative capacity. With regard to the question of reliability, it must be admitted that they are unable to withstand the rough treatment to which the Scotch boiler is often subjected by unskilled stokers, but in view of the fact that naval stokers can readily be trained to manage the water-tube boiler, there is no reason why, in the bigger shipping lines at least, it should not be an easy matter to obtain men and train them in the same way; moreover, the adoption of oil fuel on large numbers of merchant vessels tends to eliminate the human element, and thus this great objection to the use of water-tube boilers is removed. That the evaporative capacity is lower in the case of the water-tube boiler is open to question, and because of the many advantages resulting from their use it is to be regretted that this point cannot be disposed of once and for all. The water-tube boiler has already been adopted for cross-channel vessels, but the credit for adopting in our purely cargo vessels must, we believe, be given to the Luckenbach Steamship Company of New York, who are having certain of their fleet of cargo ships fitted with water-tube boilers supplying steam to geared turbines. As this company also has similar vessels fitted with the usual cylindrical type of marine boiler, it is to be hoped that comparative data will be obtained both with regard to reliability and fuel consumption. In view of the great international competition that is bound to take place in merchant shipping after the war, it would be sound policy to ascertain once and for all whether the alleged unsuitability of the water-tube boiler for cargo ships is realised in practice or not.

Electric Propulsion of Ships.

When it was officially announced that the new battle cruisers of the United States Navy were to be propelled by electric motors receiving their current from turbine-driven generators, it was felt in many quarters that there was not sufficient evidence to justify so bold an experiment. Previous to this the largest vessel to which electric propelling machinery had been fitted was the *Jupiter*, a collier also built for the United

States Navy, the machinery having been supplied by the General Electric Company of New York, and although this vessel has proved a great success, it did not seem to justify the decision to fit this class of machinery to vessels of 180,000 shaft horse-power. We call attention to the important pronouncement of Mr. W. L. R. Emmett, designer to the General Electric Company, which appears on page 247 of this issue, in which he points out the advantages accruing from the adoption of this type of drive. Shipbuilders will be asking themselves whether there is a possibility of the electric drive being worthy of adoption on cargo or passenger vessels, and whilst it is not possible to return a definite negative to that question, the important fact must not be lost sight of, that the chief advantages of the electric drive as enumerated by Mr. Emmett apply particularly to war vessels. Thus the greatest advantage is its efficiency at cruising speeds, and this is not of any importance with merchant vessels which, when working, generally run at full speed. Again, whilst increased manœuvring power is an advantage on any type of ship, it is not nearly of such great importance on merchant ships as on war vessels, and it would therefore appear, in view of the greater weight of the machinery and its higher cost, that the electric drive is not likely to be used to any large extent for vessels in the merchant service.

FURTHER VIEWS UPON GERMAN RECONSTRUCTION.

AMONG the reams which have lately been written on German reconstruction in the enemy press, there is a long article in *Hamburger Nachrichten*, due to Dr. Julius Egger (formerly one of the technical directors of the "Hapag"). The author's views and statements are worthy of some consideration. He says that existing German yards have been prepared for a long time past to undertake accelerated production of the requisite tonnage, and many new yards have been founded. It is not, however, simply a question of settling the financial problems of shipping companies before starting at once on the work of reconstruction. There are a number of other factors to be considered. Even assuming that the problem of obtaining the necessary labour and materials were solved satisfactorily, the next great problem is to decide what type of vessel shall be built. It is obvious that powerful cargo vessels must be given precedence over passenger vessels, but the advisability of concentrating mainly on the production of standard (series) vessels is, in the author's opinion, very questionable. The requirements of cargo boats for different lines and for different purposes on one route vary considerably, and the author considers that German shipping would be ill-served by over-standardisation. Quantity of shipping is the first essential after the war, but *quality* will also be required to meet the severe and enduring competition of those countries which have accumulated vast shipping resources during the war. The quality factor has hitherto been underestimated, but the greatest and best efforts must now be devoted to the cheap and rapid construction of cargo vessels which shall be standardised as far as possible (particularly in point of engines and general fittings), but which shall also be adapted to their special purpose and very economical in working.

Only a few German yards, devoted exclusively to merchant shipbuilding, are really well on the right way to produce the kind of vessels required. Those yards which have dealt largely with first class war vessels and passenger liners are at a disadvantage, in the present respect, when compared with yards which have specialised on merchant vessels. Finally, most of the new yards established primarily to deal with "reconstruction" have yet to show if and how they can cope with their difficult task. Extensions of existing yards are only likely to be satisfactory if they are organised and administered quite independently of the older part of the yard, so far as reconstructing the merchant fleet is concerned. In the interests both of shipbuilder and shipowner, any yard participating in the work of "reconstruction" should be in a position to build very economical vessels on a large scale. During the first years after the war it may be necessary to utilise every yard to its utmost capacity and all yards may find it easy to show a profit, but the time basis of efficient production and efficient product will soon make itself apparent. A vital factor which the author says has been overlooked in many of the schemes started during the war for building series-vessels and extending existing yards, is the provision of engines for the new vessels. If this really be so, it is sufficient endorsement of Egger's contention that much besides money is needed before German reconstruction plans can be put effectively into operation. Egger considers that a solution is to be found in motor propulsion, and that the leeway into which Germany has fallen during the war should be recovered by the establishment of large motor works to produce, in quantity, standardised high-efficiency motors for use on cargo vessels. He suggests that what is needed is a General German Shipbuilding Company, subscribed by existing large yards, banks and heavy industries, and having at its disposal a large new yard devoted exclusively to the construction of cargo vessels and motor equipment for the latter. Such a concern would have the advantage of the joint organisation and experience of the yards participating in its foundation; and through its industrial founders it could secure the necessary materials as well as efficient solutions to its manufacturing problems. Existing yards could render better service and secure better returns by this means than by establishing comparatively small and imperfectly specialised extensions in their own plant. A better technical staff could also be provided with less damage to existing concerns by founding a yard in which the latter were interested, instead of one which would compete with them. The end in view is to provide shipping companies quickly with a large tonnage of vessels which are at once cheap and efficient; and at the same time to accomplish this on a basis which does not involve unprofitable or unstable additions to the pre-war shipbuilding facilities.

EFFICIENT CARGO SHIPS.

IN order to meet successfully the competition which will surely take place when the war is over, it will be necessary to attain the highest degree of efficiency in the construction and running of the vessels of our merchant fleet. Within recent years a decided improvement has taken place in the design of cargo ships, and it might well be asked in which direction is still greater efficiency to be gained. Three factors enter into the problem, viz., form, construction and machinery. With regard to the first of these, the various reports which have been given by the Superintendent of the National Tank give an indication that shipowners and builders are becoming more alive to the possibilities of effecting economy in propulsion by having the advice of experts and the results of tank tests on the models of the ships contemplated. When a saving of from 10 to 20 per cent. can occasionally be effected, such means of attaining efficiency should not be ignored. Unfortunately, the greatest part of ship resistance is the frictional, and no alteration or amendment in form will have the effect of influencing this except in the slightest degree. One important point which is worthy of the serious consideration of owners and builders is the advisability of adopting flush plating forward as an aid to economy of power. The experiments carried out by Baker on a full-cargo ship form showed conclusively that the edges of strap and lap butts, and also of the longitudinal plating caused quite a considerable resistance which could be obviated by the adoption of flush plating. This very practical suggestion of Baker's should be given effect to.

The hands of shipbuilders are fairly well tied with regard to the construction of ships, and most are willing to follow the requirements of Lloyd's or similar societies as set down in their rules. It has been clearly shown, nevertheless, that it is possible to meet the standards set by Lloyd's by other means than the rules they lay

down. One of the most successful methods of construction adopted in recent years is the longitudinal system, introduced by Mr. Isherwood, by which economy in weight of material and in numbers of parts to be handled has been effected. Other systems of construction have also been patented in which greater efficiency is guaranteed than that given by ordinary methods. It should surely be within the range of possibility to evolve yet better disposition of material so that the required standard of strength can be given with less weight of structure. In saving of weight and in simpler methods of construction, and thus reducing first cost and yearly charges, economy may therefore be effected.

The question of development in propelling power seems more hopeful of affording still greater efficiency for cargo ships than either form or structure. The ordinary reciprocating engine still holds the field, but the successful application of geared turbine machinery in a few cargo ships points to a wider adoption of that type of machinery. Indications are not wanting that a large number of vessels of slow speed with geared turbines are contemplated. With improvement in the design of oil engines, and when greater reliability can be guaranteed, its adoption offers many advantages over other systems. At present there is little prospect of vessels plying on any but the Eastern routes having installations of Diesel engines, but a number of vessels are now nearing completion in this country fitted with this type of machinery. The limit of economy in either the steam engine or the oil has not yet been reached, and if engineers can effect savings in weight of machinery and fuel per horse-power, this will mean greater cargo capacity and more deadweight in a given hull. The future holds many interesting developments in store, and it is to be hoped that British engineers and shipbuilders will still be in the van in that time of development.

THE DIESEL CYCLE.

THE thermal efficiency of a heat engine is measured by the ratio of the amount of heat that is converted into mechanical work to the amount of heat supplied, and it can be readily shown that this thermal efficiency depends entirely upon the amount of compression given to the working substance in the engine before the heat is supplied; the greater the compression, the higher the efficiency. In the internal-combustion engine, *i.e.*, the gas or oil engine, air is the working substance, and the heat which is given to the air—a part of which is converted into mechanical work—is given to it in the form of a small spray of oil, or a small quantity of gas at every cycle. The combustion of the fuel with the oxygen of the air generates the heat which is utilised by the engine, the heat being given to the working substance at the moment of combustion. Hence, the higher the pressure in the cylinder before combustion occurs, the greater will be the amount of heat converted into mechanical work.

The first practical cycle of operations used in internal combustion engines was the Otto cycle, in which a mixture of air and fue is drawn into the cylinder, compressed by the return stroke of the piston and then exploded, usually by means of an electric spark from a magneto, this being the cycle of operations adopted on gas engines and on motor-car engines. The amount of compression is, however, limited by the fact that as the pressure increases the temperature rises, and a point is ultimately reached when the temperature is sufficient to automatically ignite the mixture of air and fuel in the cylinder. Thus the efficiency of the Otto engine is limited to a definite figure, depending on the nature of the fuel employed, because if the compression is carried beyond a certain amount pre-ignition or back-firing occurs, the explosion then driving the engine in the wrong direction.

In order to obtain the higher efficiency resulting from a higher compression, Dr. Diesel conceived the idea of compressing the working substance by itself and injecting the fuel into the cylinder *after* compression, this being the essential characteristic of the Diesel cycle. Thus, whereas with the Otto engine using either coal-gas or petrol vapour it is impossible to employ a greater compression pressure than about 100 lbs. per sq. in., without danger of pre-ignition, in the Diesel engine pure air is compressed usually to about 500 lbs. per sq. in., the fuel being then injected in the form of a fine spray.

The results achieved exceeded the most sanguine expectations of the inventor. In the first place there was the undoubted increase in thermal efficiency resulting from the higher compression, which makes the Diesel engine about 50 per cent. more efficient than the Otto engine, the usual figures for good engines of moderate power being 20 per cent. in the case of the Diesel engine against 14 per cent. in the case of the Otto engine. But other advantages followed as a result of this higher compression, one of the most important of which was that, consequent upon the high temperature of the air in the cylinder after compression, no sooner was the fuel injected into the cylinder than it automatically lighted and continued to burn until either the supply of fuel was cut off, or until all the oxygen of the air was used up. This means that with the Diesel engine no sparking device is needed, and therefore one of the most fertile sources of trouble in the older type of internal-combustion engine is eliminated. The combustion of the fuel, however, is gradual, so that although the temperature in the cylinder rises rapidly to a very high figure, the change of pressure, if any, is also gradual. It is usually arranged that the rate at which the fuel is injected is such that the tendency of the pressure to rise is just counteracted by the fall in pressure that would occur as a result of the piston moving forward on its working stroke, so that combustion occurs at practically constant pressure. Hence in the Diesel engine there is no sudden change of pressure similar to that due to the explosion in the Otto engine, and therefore the engine works with much less vibration and the wear on the bearings is reduced to a minimum.

Yet another great advantage may be mentioned, and one which led to the adoption of the Diesel engine as an engine suitable for the propulsion of ships. As a result of the high temperature in the cylinder after compression of the air, it has been found that almost any kind of fuel can be used, provided it is injected into the cylinder in the form of a fine spray. With the Otto engine the fuel employed must be so rich in hydro-carbons that it will ignite with the air, as a result of the passing of an electric spark. Coal gas, petrol vapour, and one or two other substances satisfy this condition, but the heavy oil used as fuel on board ship is absolutely unsuited for the purpose. It is, however, just because this heavy residual oil can be used in the Diesel engine that the employment of this type of engine has been found to be so economical.

There are, however, limits to the amount of compression that can be employed in the Diesel cycle, but these result not from causes inherent to the cycle itself, but simply because we cannot construct cylinders which can safely withstand the high temperatures which follow the combustion of fuel in air which has itself been previously compressed to a high pressure. This high temperature has so far proved to be the great disadvantage of the Diesel cycle, limiting the compression pressure of the air to about 500 lbs. per sq. in., although higher pressures have been tried experimentally, and limiting also the size of the cylinder so that the maximum power which can be developed per cylinder seldom exceeds about 250 h.p.

PUBLICATIONS RECEIVED.

[*A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.*]

Report of the Committee of the Privy Council for Scientific and Industrial Research, 1916-17. London: His Majesty's Stationery Office, Imperial House, Kingsway, W.C. 1, 9½ in. × 6 in. × ⅛ in. 63 pp. Price 3d.

This is the second annual report issued by the new Research Department which has been formed in order to provide a permanent

basis for research in this country and to co-operate with similar attempts in the Dominions. The report indicates that there are three ways of organising industrial research. The simplest is the case where a single firm can work out a problem and itself fully exploit the results. In most cases, however, problems of industrial research will concern many firms—sometimes many industries—they will require the expenditure of large sums of money, and the co-operation of many workers for long periods of time. Most individual firms cannot undertake this long and costly process, and hence the second way of organising industrial research is by the establishment of "trade research organisations to be constituted as needed for each industry or group of industries, and which are to be aided out of the funds granted by the Government to the Department. Thirdly, there are many cases where the problem is so complex, or else so immediately concerns the consumer rather than the producer, that co-operation between manufacturing firms is not possible. This is direct work for the Research Department, and hence the establishment of the Full Research Board under the direction of Sir George Beilby, which will itself conduct research.

The main lines of policy of the new Department are thus being slowly worked out, and a considerable number of researches aided or initiated by the Department are now going on. In addition to the work of the Fuel Research Board, to mention one or two, researches are being carried out to consider the effect of superheated steam, the flow of steam through nozzles, and the corrosion of non-ferrous metals, interesting accounts of which are given.

The report ends by noting the altered attitude of manufacturers and men of business towards the claims of research and education, and reiterates the conviction that a sure advance in industrial science can only be made when the field of work is adequately surveyed beforehand, and an organised plan of necessary research carried out.

The Indicator Handbook; Part II. By Charles N. Pickworth. London: Emmott & Co., Ltd., 20, Bedford Street, W.C. 2. 7⅞ in. × 5 in. × ½ in. 139 pp., with diagrams. Cloth, 3s. net.

This very successful little book has now reached its sixth edition, which is a sufficient tribute to its career of usefulness. In the new addition, the author has introduced a table of mean pressure factors, from which, knowing the ratio of expansion in the cylinder, the mean effective pressure on the piston can be calculated by the simple multiplication of the given factor with the initial pressure, and save for a few minor revisions, this is the only change that has been made.

In the fifth edition the author considerably improved the chapter dealing with indicator diagrams from gas and oil engines, augmenting considerably the information given in the earlier editions, but save for one short paragraph, his remarks are applied to engines working on the Otto cycle. In view of the large increase in the number of engines working on the Diesel cycle, and especially in view of the successful adoption of this type of engine for the purpose of ship propulsion, it is greatly to be regretted that in the new edition it has not been found possible to considerably extend this section so as to deal with the peculiarities of the Diesel engine diagram, the information which can be obtained from it, and the difficulties of obtaining diagrams from high-powered Diesel engines such as are used in marine work. The Diesel cycle bids fair to completely displace the Otto cycle for all internal-combustion engines except those of the smallest powers, and therefore the importance of such a section is evident.

List of the Principal Acts of Parliament, Regulations, Orders, Instructions and Notices now in force relating to Merchant Shipping. London: Published by H.M. Stationery Office. 8½ in. × 5½ in. 34 pages. Price, 3d. net.

This useful list has been prepared for the information of shipowners, masters, and others interested in the regulations issued from time to time by the Marine Department of the Board of Trade. There is an index of 7½ pages, and the principal instructions, notices, &c., issued during the war are given separately for convenience of reference.

Ballin's Task.—On the occasion of Herr Ballin's sixtieth birthday (August 15), *Hansa* paid tribute to the services which he has rendered to German shipping in the past, and said that perhaps the greatest part of his life's work remains yet to be done. German shipping looks to Ballin as one of the greatest of its leaders in the tremendous task of reconstruction.

THE PROBLEM OF HAMBURG.

It is doubtful whether any other city in Germany has been paralysed by the war to anything like the same extent as Hamburg. The whole economic life of the port depended on overseas shipping, and that ceased with the outbreak of war. In addition to the appalling loss thus sustained, Hamburg has suffered much in the past from the jealous attitude of Prussia and of Berlin. Merchants, shipowners and others with interests vested in Hamburg are naturally concerned lest the needs of the port be overridden by the Imperial authorities or by those under their patronage. A leading article in *Hamburger Nachrichten* makes frequent reference to a publication brought out by the Zentralverband der Deutschen Bezirksgruppe stating what are considered essential measures and concessions in the reconstruction of Hamburg's trade, shipping and industry. A strong appeal is made for freedom in the individual development of every kind of business concern. Without this, "the freedom of the seas will be worthless." What is feared is the "machine organisation" of economic life and the suppression of personal independence and initiative to which Hamburg owes its past development to an unusual degree. Excessive bureaucratic control and the activity of "strong economic groups" are alike viewed with uneasiness. There is a danger that control and restrictions which have been accepted as necessary war measures will be retained after the war. Trade, shipping and industry must be left free, Hanseatic interests must be represented more strongly in the Imperial Bundesrat, and in particular Hamburg must have its own representative instead of the three Hanseatic towns being represented by one member. Berlin has been made the seat of nearly all the war—and reconstruction—economic organisations, and Hamburg demands adequate representation therein. Other demands, which obviously assume a "German peace," relate to improved colonial organisation, international coaling stations, German cables, improved consular service, elaborate propaganda schemes, and so forth.

The geographical position of Hamburg and its past developments and circumstances have made it peculiarly fitted for a dependent on sea traffic, but it is now urged that so important an economic body as the State of Hamburg should not be dependent on one branch of industry. The harbour area needs extending and improving, and dues should be reduced to permit of more successful competition with Rotterdam and Antwerp, but the facilities for inland trading also need improvement. Railway facilities should be extended and railway policy and tariffs revised. The Danube-Oder-Elbe Canal, with a branch to Leipzig, is supported as a necessary counter-stroke to the proposed Danube-Rhine connection. Sites for industrial establishments must be provided (if necessary by exchange and agreement with Prussia), and Hamburg must attain an industrial eminence proportionate to the materials and other resources at its disposal and worthy of "the bridgehead of Germany and Central Europe."

Much of this memorial is in a high-flown strain and expressive of Hamburg's "demands," but the concluding section discloses the true source of uneasiness and reveals Hamburg as a crippled, almost bankrupt supplicant for financial assistance. Full indemnity is asked for all direct war losses to shipping and foreign trade. This is asked from the Government, and "we express the hope that this outlay may be recovered from our enemies, but German industry as a whole has accumulated large capital reserves during the war and is in a position to bear this expense from its own resources if necessary." This claim upon German industry is based upon the fact that the State of Hamburg has spent hundreds of millions (of marks) in the past on schemes and equipment which have certainly benefited German industry and national economics as a whole. Hamburg, which has sustained more than normal loss and hardship from the war, claims fair representation and participation in political and economic projects, and asks from the Empire a measure of indemnity and subsidy proportionate to the part which the port has played in Imperial development.

ELECTRICAL PROPULSION FOR U.S. BATTLE CRUISERS.

In a discussion which has just come to hand on "The Alquist Gearing for Ship Propulsion," read by Mr. W. L. R. Emmett, of the General Electric Company, New York, before the American Society of Naval Architects and Marine Engineers in New York, a question was asked as to the reasons for adopting the electric drive for some of the latest U.S.A. battleships instead of the turbine drive. In reply Mr. Emmett submitted the following, which forms part of an article recently written by him upon this subject:—

The writer has for many years actively advocated electric drive for the larger vessels of the U.S.A. Navy, and as a result of a long campaign of designing, experimentation, and educational activity, this method has been adopted on a large scale by the U.S. Navy Department. Electric propelling machinery has been ordered for the last seven battleships which have been authorised, and is specified for the four new battle cruisers which form part of the present naval programme. These battleships are very large and important vessels requiring 33,000 h.p. each, and the battle cruisers present the most stupendous propulsion problem ever presented, since they require no less than 180,000 h.p. each. Only two or three of our cities use as much electricity as will be generated on one of these ships when she makes her full speed of 35 knots.

Electric propulsion has from the first had many opponents, and it is still being very actively opposed by nearly all the shipbuilders of the country; by Sir Charles Parsons, Mr. Charles Curtis, and others who have had important influence in marine engineering. Most of this opposition is undoubtedly sincere, but is not altogether disinterested, since shipbuilders want to use machinery which they know how to build and since turbine inventors have in the past received large royalties from turbine-driven ships which are cut off by the advent of electric drive. Although the power still comes from turbines, the electric drive is, by license agreements, free from royalty charges. The possibilities of large electrical apparatus do not appeal strongly to those who are not thoroughly familiar with its uses. Electric propelling machinery will be generally heavier and more expensive than the best developments of geared turbine machinery, and variations of opinion have rested upon the relative importance given to advantages and disadvantages.

The General Electric Company (of New York) has, under the writer's direction, also carried on extensive developments and operations in ship propulsion by turbines connected to ships' propellers by gearing. Machinery of this class for 79 large vessels has been contracted for by them, and many of these ships are in service and showing unqualified success. Our view, therefore, is not entirely one-sided, and although it may be considered that we are particularly interested in the development of the uses of electrical machinery, we believe that we have judged fairly and that our efforts will lead to important and lasting success.

In explaining the advantages of electric drive, comparisons will be made only with the geared turbine drive. All other methods for propelling large vessels may be considered obsolete, although many ships are still being built with engines or with direct connected turbines.

A wise rule in engineering is to advocate new things only for the purpose in which they afford the greatest advantages, and this rule has been closely followed in the promotion of electric propulsion which was originally advocated mainly for large warships. This first move was made before the use of mechanical gearing for such a purpose had been suggested, but its advantages for this particular use are so striking that it is still believed that the wonderful development of gearing possibilities have not changed the original case.

The subject of electric drive is too large for full discussion in such an article as this. Its possibilities and advantages can be best suggested by taking as an example the case of the new U.S. battle cruisers in which its use has been and still is the subject of much discussion and criticism. This may be considered as the extreme case where advantages are most important and in which the disadvantage of increased weight is most serious.

Four of these vessels are authorised in the Navy Bill of 1916. They are designed to make 35 knots each, requiring 180,000 h.p. delivered to four shafts turning at full speed about 250 r.p.m.. These are the fastest and most highly-powered vessels ever built. The electrical installation proposed in each of them far exceeds in extent any single installation ever made for any purpose.

APPARATUS PROPOSED.

It is proposed to instal in these ships four high-speed turbine-driven generating units of the best type, similar in most respects to those used in power stations on shore. Upon each of the four propeller shafts will be mounted two independent induction motors. Cable connections and switching arrangements will be provided by which any combination of motors and generators can be immediately provided for and by which all the changes of connections for operation, reversal, &c., can be instantly made under all running conditions. The details of design and method of operation need not be described here. They are quite simple, in fact much simpler than in most electrical installations. The electric supply is produced for the one purpose of propulsion and is varied or discontinued according to need. Connections are changed only on dead circuit, even in the ordinary operations of stopping, starting and reversing; and automatic means are provided by which any diversion of current from any cause produces an unbalancing which instantly breaks the field circuit and de-energises the system.

The aggregate weight of this equipment, with cables, switches, instruments and controlling apparatus is 1,865 tons.

EQUIPMENT IF GEAR-DRIVEN.

If such a vessel were gear-driven, a plurality of ahead turbines would be connected through helical gearing to each propeller shaft. One or more backing turbines would also be connected through the same gearing, and if good cruising economy were sought it would also be necessary to provide cruising turbines connected through separate systems of gearing and arranged with couplings so that they could be detached during high-speed operation.

A just comparison of this method with the electric equipment proposed would require a complete design and analytical study of the geared equipment and its performances. The writer has not made such a study in the case of these vessels, therefore no exact figures can be given. The space and number of turbine elements connected to each shaft will determine the space required for turbines, and this spacing will govern the length and weight of the shafts, piping, valves and supporting structures.

In some of the installations which have been proposed abroad for vessels of much less power than these, the multiplication of parts has been very great and the size and extent of turbines and supporting structures such that the adoption of similar methods in these ships would certainly give weights nearly as great, if not greater, than those proposed for the electric drive. Some of our shipbuilders, in bidding to the Government on these vessels, have stated that by using geared equipment they could save about 1,000 tons in weight and about $1,000,000 in cost, but whether these statements will bear analysis or not cannot be said without study of their detailed designs, if any have been made.

DETACHMENT.

Without further description or discussion of either type of apparatus, we are in a position to make a comparison which constitutes one of the most important advantages of electric drive. In the geared equipment, each shaft has a system of turbines, gears, bearings, thrust balancing devices, and lubricating systems, all mechanically locked together. With high-speed machinery any kind of trouble with any of these parts will almost certainly necessitate the immediate stoppage of the whole system. To keep a high-speed turbine running out of balance or with bearing trouble

is impossible, and the gearing part would present almost equal difficulty. In the event of mechanical trouble of such character, a ship would have to be stopped until the wreck could be cleared. The work necessary to uncouple and disconnect any part of such very heavy apparatus would be a serious matter, involving much time, including that required to stop the ship. After the disconnection was made, the idle propeller would act as a very serious drag on a fast vessel.

In the electrically-driven ship there is no mechanical connection of the shaft to anything but the rotors of the motors. These are self-contained Ironclad structures and cannot by any possibility be subject to mechanical interference. The shafts are subject to the same possibilities of bearing or thrust trouble as shafts in other ships, but the presence of the motors does not increase this danger, and the speed being low it is remote in any case. With this equipment, any motor, generator, or turbine, if in any kind of trouble, can be instantly disconnected without stopping the ship, and with only a small loss from the highest speed capacity.

Interchangeability.

Such interchangeability as this power of disconnection gives, constitutes one of the most important advantages of electric drive in such a ship. With one motor out of eight in trouble, only one-eighth of the maximum capacity is lost, and the ship's maximum speed is impaired by only about one knot. If a generator or turbine is in trouble the maximum speed is reduced only about two knots. With two generating units and four motors out, the ship can make 26 knots, and with three generators and four motors out she can make 19 knots. If parts give trouble they are simply cut out and repaired at leisure or as opportunity affords. The value of this interchangeability in a warship can hardly be over-estimated; it largely overcomes the military danger incident to accidents to the driving power, a danger which has always been of primary importance.

Backing Power.

In turbine-driven ships, not electric, it is necessary to provide backing turbines which must run idle in the reverse direction when the ship is going ahead. These backing turbines involve complications which are very objectionable, and if these are reduced to a desirable minimum the backing power will be greatly inferior to that easily provided with electric drive. Experiment has shown that a turbine forced in an opposite direction involves about seven times as much friction loss as when driven in its normal direction. This loss is very appreciable in the backing turbines of ships and causes heating which must be dissipated by circulating steam, which causes further loss and waste. There are also serious difficulties and dangers in high-speed apparatus incident to the abrupt and wide changes of temperature where steam is suddenly admitted to a cold reversing turbine. Steam which expands without doing work has a high temperature and, if work is done upon it by a reversed turbine, the heat is considerably increased. With superheat these temperatures may be extreme, and they affect the main turbine as well as the other, since it also must be used for reversal of direction and since the two often occupy the same casing. The mechanical effect of such abrupt change of steam temperature upon fragile structures presenting very extended surfaces is a matter which has been little considered, but which has caused much serious trouble. With electric drive the turbine never need be stopped when the ship is under way, and its operation is easier than in a power station because the load is steadier. With modern high-speed turbines, superheat affords large gains in fuel economy, and the ability to safely use high degrees of superheat may constitute one of the important reasons for adopting electric drive.

Efficiency of Transmission.

Various statements and estimates have been published concerning losses in high-speed gearing for which the authority is not known by the writer. Tests at Schenectady have shown losses about double those generally estimated, with rapid diminution of efficiency as load falls. These tests were of a most accurate character with large smooth-running gears and by the motor generator method where losses alone were measured, the same power being transmitted with and without the gearing.

With the electric drive in these battle cruisers, the losses from turbine to propeller shaft at full speed will amount to 7 per cent., and by adjustment of voltage the transmission efficiency can be kept equally good at all speeds. Considering gearing losses, reversing turbine losses, losses incident to necessary sub-divisions of the turbine and additional packings, it is believed that the actual transmission from turbine blades to shaft at full speed cannot be made more than 2 per cent. better in the geared equipment than it is in the electric. At reduced loads the geared equipment will be much less efficient. The normal cruising speed of these ships will require less than one-tenth of full load, and the drag of gearing, bearings, reversing turbines and idle parts of main turbines will be very serious. Some of these matters seem to have been ignored in statements which have recently been made on the subject.

Cruising Economy.

With the electric design, the number of motors and turbines used can be adapted to the demand for power, while with the other all parts must be kept running. This gives very important gain in economy at all speeds below the maximum. At 19 knots only one turbine is required to drive the ship, and electrical arrangements are made by which it can be run at full speed instead of running at half speed as it would if the ratio were fixed as by gearing. Thus the steam efficiency at 19 knots, a desirable cruising speed, is equal to the best attainable at any speed. Assertions which have been made by shipbuilders and others that equal cruising results can be obtained by the use of cruising turbines are obviously absurd. The cruising turbines themselves would be greatly inferior to the single main turbine so used, and they would be burdened with all the drags which are mentioned above. Cruising economy gives increased cruising radius without renewal of fuel supply. This has always been considered a matter of the greatest importance in warships; it is a feature in respect to which electric drive can have no rival.

State of Development and Expediency.

Enough has been said to give an idea of the reasons for the use of electricity in such ships, but in addition it should be considered that everything used in such an electric installation is a matter of exact knowledge and wide experience, while methods of gearing on such a scale are backed by little and brief experience and are the subject of wide difference of opinion as to methods of design and proportions.

The writer believes that the difference of weight and cost which have been predicted by shipbuilders and others are not based upon just comparisons, but that even if they are true, they are not sufficient to balance the practical merits of electric drive for such vessels.

For these reasons it is believed that when prejudices are overcome, electricity will develop an extensive use in large high-power warships. In such light vessels as scouts and destroyers, for reasons of weight and space, it is relatively much less desirable; but even in such cases, with the lightest and most compact designs, and with very high pressure and superheat, it might in the future develop a legitimate application. In merchant ships also it may afford great advantages. With electricity turbine units can be installed in duplicate, either in single or twin-screw ships. Machinery can be installed where convenient, with motors near propellers and turbines near boilers; auxiliaries can be driven electrically from the main units. The highest superheat can be used without danger or complication, and main units can be applied to other power uses, such as cargo pumping and handling. These advantages have led to the preference of electric drive at a higher price in certain large freighters recently ordered, and will doubtless lead to many other applications in ships of various types.

MOTOR SEA-GOING BARGES.

Whilst he use of either steam or oil engines for driving large ocean-going vessels has become almost universal. it is rather remarkable that for short distance sea-going traffic, such as is carried on by small coasting vessels, sailing ships should still be used to a very large extent. Especially is this true of the smallest type of coasting vessel, the sea-going barge which, with but few exceptions, is still of the same primitive wind-driven form as was used fifty and a hundred years ago. Power-driven barges have been built fitted with boiler and steam engine, but the space occupied by the machinery

Fig. 1.—Sea-going Motor Barge "Wasp."

was comparatively speaking large and the carrying capacity of the vessel was reduced in consequence. The development of the internal-combustion engine, however, made it possible to construct machinery capable of developing the same horse-power, but occupy-

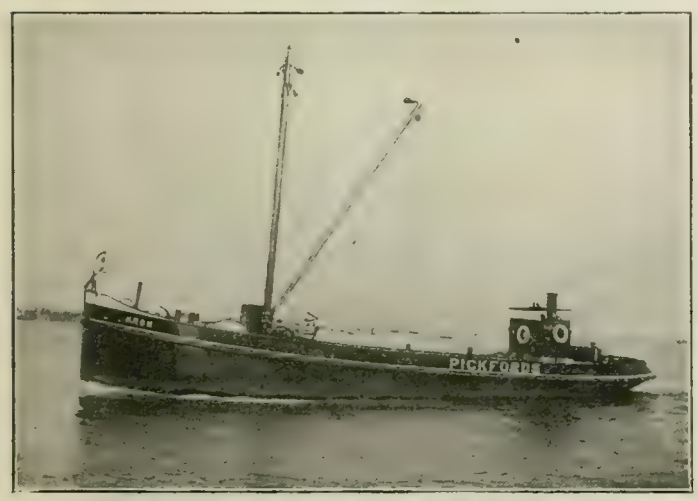


Fig. 2.—Sea-going Motor Barge "Krom."

ing far less space than the steam-engine plant. It can be safely said that the oil engine has proved itself to be in every way peculiarly adapted for the driving of small coasting vessels, and the motor-driven barge should be far more economical in every way than the older sea-going sailing barge.

The type of engine which has been developed for this service is the well-known semi-Diesel or hot-bulb type, which, whilst it can be run on almost any kind of oil as fuel, most commonly uses heavy oil, although ordinary commercial paraffin is frequently employed, and as might be expected from the fact that the country abounds in canals, the motor-driven barge was first of all developed in Holland, and vessels were imported from that country to England.

One of the first of these vessels to be built in Holland for service in this country was the *Wasp*, which was built 11 years ago by D. Goedkoop, Junr., & Co., of Amsterdam, and engined by the same company with one of their L.P. type Kromhout engines, developing 28 b.h.p. This interesting little boat is of the following dimensions: Length between perpendiculars, 55 ft. 6 in.; breadth, moulded, 12 ft. 3 in.; and depth, moulded, amidships, 5 ft. 9 in.; and is shown in Fig. 1. As already stated, she is fitted with a 28 b.h.p. L.P. type Kromhout engine, working on the four-stroke cycle. The speed of the vessel is 7 knots with 18 tons deadweight at 33 cubic ft. per ton. The fuel used is ordinary commercial paraffin with a density of from 0·820 to 0·840, the paraffin being fed to the engine by a pump which is automatically governed by the engine. The ignition is induced by a low-tension magneto, with oscillating armature similar to that used on modern gas engines. The control of the engine is

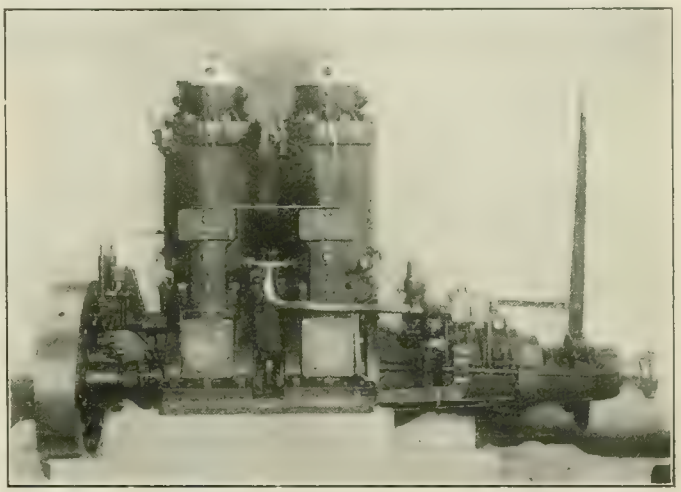


Fig. 3.—90 B.H.P. Kromhout Oil Engine, as fitted to the "Krom."

carried up to the deck alongside the steering wheel, and only one lever is necessary for changing from going ahead to going astern, or for disengaging the propeller with the engine running. The Kromhout reverse gear, which is a feature of the Kromhout marine engine, is fitted.

The *Wasp* was built solely for cargo carrying purposes as opposed to the few old craft which had been converted to the oil-engine drive before the date that the *Wasp* was commissioned, and she has been in continuous service between the Isle of Wight and the mainland ever since; the motor when recently inspected was found to be running as well as ever.

The success of the *Wasp* led her owners (Pickfords, Ltd.) to order two additional vessels. These were to be generally similar to, only larger than, the *Wasp*. These are sister ships and are 86 ft. long, with moulded breadth 16 ft. 3 in., and depth 7 ft., having a cargo capacity of 100 tons. They are named the *Bat* and the *Krom*, the latter vessel being illustrated in Fig. 2.

These two boats are fitted with a 90 b.h.p. Kromhout engine of the R.O. type, which give them a speed when loaded of from 7 to 8 knots. This type of engine, which is illustrated in Fig. 3, works

on the two-stroke cycle and is of the well-known hot-bulb type. It is automatically governed, the fuel used being heavy oil, the most suitable being gas oil of a specific gravity 0·860. The Kromhout reverse gear is also fitted to this type of engine, only one lever carried up alongside the steering wheel being required for "Stop," "Ahead," or "Astern."

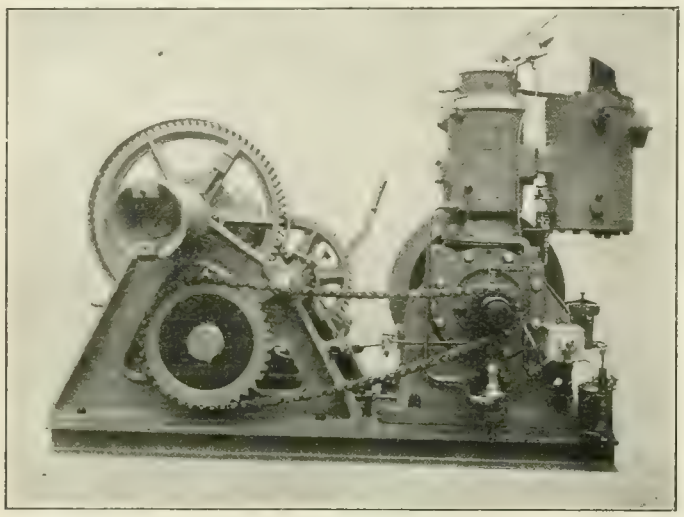


Fig. 4.—2-ton Cargo Winch, driven by Kromhout Oil Engine.

These boats have now been running for some considerable time between Southampton, Portsmouth, and the Isle of Wight, and have proved themselves superior to the older steam engine-driven barges which were used before the advent of the oil engine-driven barges.

The Kromhout engine was first introduced into this country by Perman & Co., Ltd., of 82 and 83, Fenchurch Street, London, and is being extensively manufactured in this

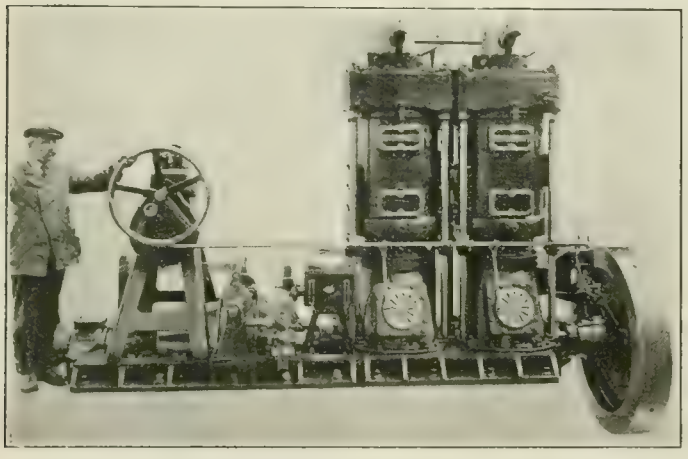
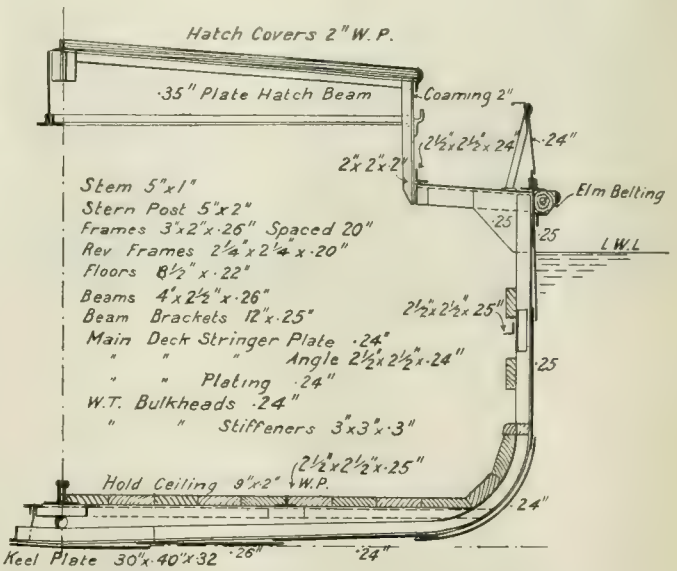


Fig. 5.—130 B.H.P. British Kromhout Marine Oil Engine, with Reverse Gear.

country. A large number of vessels similar to those just described have been built, and in view of the demand, Perman & Co. have been led to adopt a system of standard designs. This has been done in conjunction with Messrs. Courtney & Paul, naval architects, of Southampton, and various standard models of motor-driven barges have been designed to carry from 15 up to 500 tons deadweight, but the smaller types appear to be in greatest demand.

The general arrangement of the standard sea-going barge, to carry from 65 to 70 tons of cargo, is shown on page 251, the midship section being shown below. It will be seen that the vessel is of the usual coaster type, with raised forecastle, and a hatch of considerable length. She is fitted with a motor winch of the standard Kromhout type, capable of lifting 1 ton when in double gear at a rate of 60 ft. per minute, or ½ ton when in single gear at a rate of 120 ft. per minute. The larger vessels are fitted with motor-driven winches of a greater lifting capacity, the 2-ton Kromhout cargo winch being illustrated in Fig. 4.

The main engine develops 70 b.h.p. at about 330 r.p.m., the fuel consumption working out at about 0·58 pint per b.h.p. per hour when running on gas oil. Any kind of cheap oil can, however, be used as fuel, and paraffin can also be used. A blow-lamp is used for starting purposes, but water injection is not required as is frequently the case with engines working on the semi-Diesel principle, and in the present type of Kromhout engine the hot bulb has been eliminated. A standard Kromhout reverse gear is fitted to the motor, and it is found in practice that for comparatively low powers, say up to 90 b.h.p., reversing by this means is the



Midship Section of 70-ft. Sea-going Barge.

simplest and safest way, the motor being entirely controlled from the steering position.

For larger powers, 130 and 180 b.h.p., whilst the reverse gear is of the same type, a hand wheel is necessary to operate the reversing mechanism. This is clearly shown in Fig. 5, which represents a British Kromhout marine oil engine of 130 b.h.p., together with its reverse gear. The details of the construction and working of this engine were described in these pages some time ago. (See *Shipbuilding and Shipping Record*, Vol. VIII., p. 328.) For still larger engines of 275 and 320 b h.p., the makers use compressed air for reversing purposes, and the engine is reversed in much the same manner as a steam engine.

First Concrete Floating Dock.—The Fougners Staalbeton Company (Moss) recently completed the first floating dock to be made of reinforced concrete. This is for a small yard in Christiania and has a carrying capacity of only 100 tons, the length being 77 ft. and the breadth 25½ ft. The dock was tested, immediately after launching, with a 100-ton concrete lighter. The trial was thoroughly satisfactory. There are nine watertight divisions in the dock, which may be emptied in less than one hour by electrically-driven pumps. The company has a number of small concrete docks on order, and orders for larger ones up to 8,000 tons are in prospect. These orders should now materialise and will involve extensions to the Fougners Company's plant.

THE MAINTENANCE OF THE BRITISH MERCANTILE MARINE.—II.

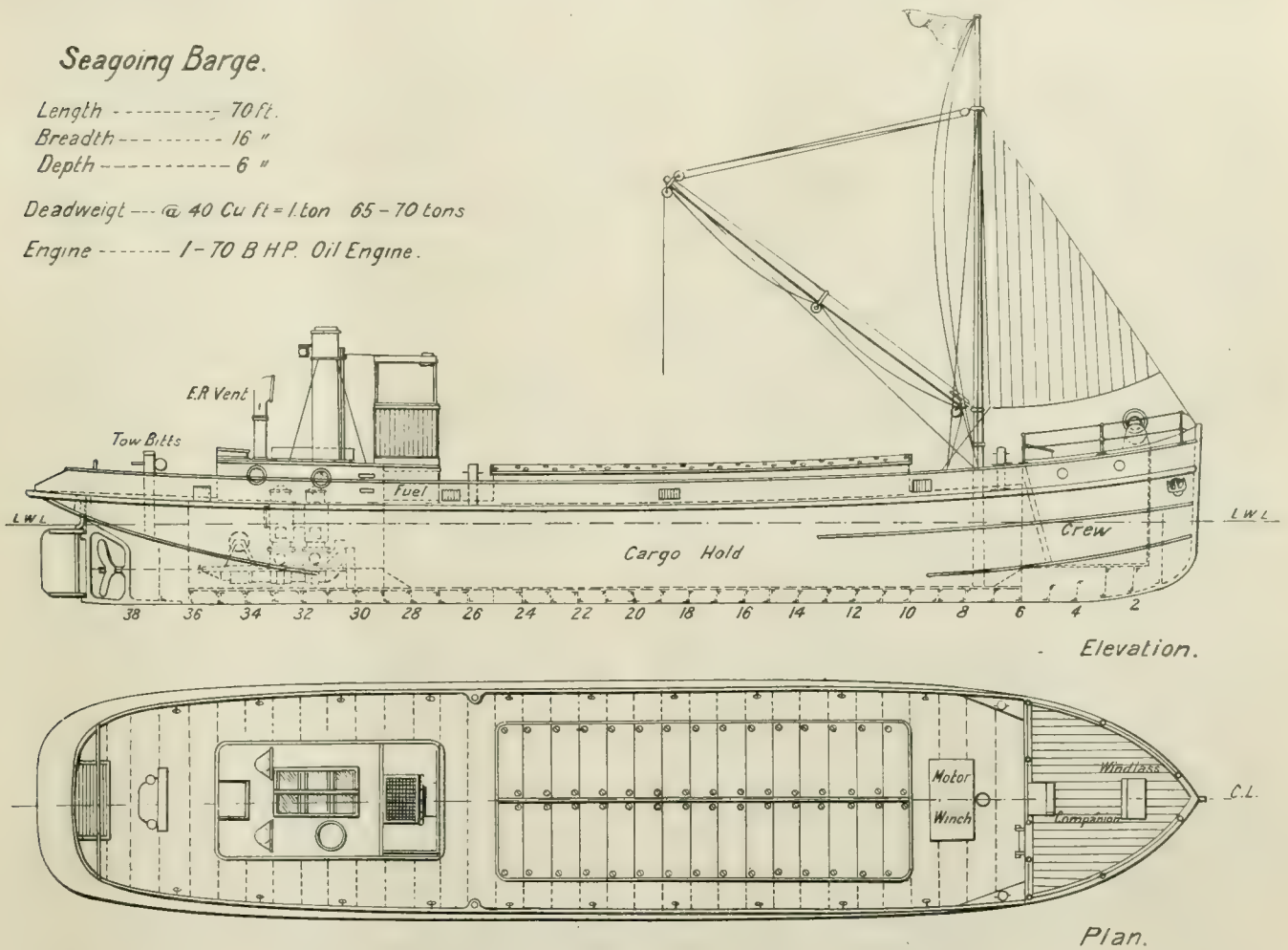
We published last week the principal recommendations of the Joint Committee appointed by the Chamber of Shipping of the United Kingdom and the Liverpool Steam Ship Owners' Association, in so far as purely shipping questions are concerned. It may be convenient at this stage to give some of the findings of the Committee in respect to our oversea trade and its effect on shipping generally.

It is pointed out in the report that the development in the international trade of the world in the 10 years preceding the war was rapid and the part played by the manufacturers and shipowners of the United Kingdom in that development was striking. The belief so commonly held that we were ceasing to be a nation of manufacturers and producers and becoming merely a nation of merchants and middlemen is not supported by the official figures. It was, in fact, as manufacturers and producers that we increased the value of our exports by £218,000,000 out of the total increase of £263,000,000.

As against the exports, we increased in the 10 years the value of our imports from £551,000,000 to £768,000,000, an increase of £217,000,000, equalling 39 per cent. Of this the value of our imports of foreign manufactures increased from £115,000,000 to £164,000,000, an increase of £49,000,000, and the value of our transit trade from £70,000,000 to £109,000,000, an increase of £39,000,000. The balance of the increase, £129,000,000, was made up in the value of imports of food and raw material.

In each of the 10 years prior to 1904 the value of our exports represented about 66 per cent. of the value of our imports, but in the 10 years ended in 1913 our exports increased more rapidly than our imports, until in 1913 their value represented upwards of 82 per cent. of the value of our imports. During the 10 years under review all the evidence available points to our having added very considerably to our investments in foreign countries, and if this be so, it follows that the rise in the comparative value of our exports as against that of our imports was evidence of growing wealth. The extraordinary financial strength shown by the nation during the war confirms this conclusion.

The importing power of a nation must, in the main, be dependent on its power to create in its own favour international credits by the exports of its manufactures and the raw materials it produces, for when once such credits are created, it can pick and choose between the imports it purchases. Compared with our principal competitors, in the nine years ending with 1912 (the last year for which comparative figures are available) the United Kingdom increased the value of the exports of its own manufactures by £142,000,000 as against an increase of £126,000,000 in the value of the export from Germany of German manufactures, and of £67,000,000 in those of the United States.* Taking all exports together, those of the United Kingdom increased in value in the nine years by 62 per cent. as against increases of 71 per cent. from Germany and 51 per cent. from the United States. Germany, it must be noted, made proportionately a greater stride than the United Kingdom.



General Arrangement of 70-ft. Sea-going Barge. (*See page* 250.)

* At the time these statistics were drawn up Roumania and the United States had not entered on the side of the Allies. These countries are therefore shown throughout the report as neutral.

There were considerable variations in the rate of the increases in trade between different countries, but the United Kingdom, Germany and the United States all showed substantial increases in their export trades with all nations. In the export of our manufactures the greatest increase was in our Empire trade, whilst in Germany the greatest increase was in its trade with the countries on its land frontiers.

The official figures for 1913 show that, in value, about 44 per cent. of the exports of our manufactures were sent to places within the Empire, India taking about 16 per cent. The balance was sent as to about 15 per cent. to our Allies, 32 per cent. to countries which are now neutral, and 9 per cent. to enemy countries. Of our exports of coal about 8 per cent. was sent to places within the Empire, 44 per cent. to our Allies, 36 per cent. to neutral countries, and 12 per cent. to enemy countries. On the other hand, of our imported supplies of food we obtained about 26 per cent. within the Empire, 11 per cent. from the Allies, 54 per cent. from neutral countries, and 9 per cent. from enemy countries. Of our imported supplies of raw material we obtained about 31 per cent. within the Empire, 16 per cent. from the Allies, 49 per cent. from neutral countries, and 4 per cent. from enemy countries.

The British Dominions and Possessions.

In the 10 years ending with 1913, the value of the exports from the British Dominions and Possessions increased from £327,000,000 to £553,000,000, an increase of £226,000,000, equalling 70 per cent.; whilst the value of their imports increased from £307,000,000 to £562,000,000, an increase of £255,000,000, equalling 83 per cent. Of the increase in the exports from the Empire overseas £92,000,000 were sent to the United Kingdom, £10,000,000 to other parts of the Empire, £14,000,000 to France, £40,000,000 to the United States, £21,000,000 to Germany, and £49,000,000 to other foreign countries. Of the increase in the imports into the Empire overseas, £101,000,000 were obtained from the United Kingdom, £16,000,000 from other parts of the Empire, £4,000,000 from France, £65,000,000 from the United States, £15,000,000 from Germany and £54,000,000 from other foreign countries.

A detailed examination of the figures shows that throughout the 10 years the United Kingdom maintained its proportion, amounting to nearly one-half, of both the export and import trades of the Empire beyond the seas; but that although the value of the trade between other parts of the Empire had increased, the proportion of those trades to the whole had been maintained. The share of foreign countries, and in particular of the United States and Germany, in the Empire trade increased in the 10 years both in amount and in its relation to the total trade. In 1913, of the total trade of the Empire beyond the seas, 46 per cent. was with the United Kingdom, 15 per cent. with other parts of the Empire, 3 per cent. with France, 9 per cent. with the United States, 6 per cent. with Germany, and 21 per cent. with other foreign countries.

In comparison with the development in the trade of the colonies of foreign countries in the nine years ending in 1912, whilst the trade of the British Empire overseas increased by £442,000,000, the German colonial trade increased by only £11,000,000; but the increase in the German colonial trade was 275 per cent., whilst that of the Empire overseas was only 70 per cent.

The Foreign Trade of Other Countries.

The Committee point out that the official information in regard to the international trade of foreign countries is not complete, but from such information as is available it would appear that in the nine years ending in 1912, the total value of the imports increased from £1,770,000,000 to £3,092,000,000, an increase of £1,322,000,000; and of the exports, from £1,748,000,000 to £2,928,000,000, an increase of £1,180,000,000. In this trade the value of the imports into the Allied countries increased from £537,000,000 to £954,000,000, into the Neutral countries from £807,000,000 to £1,416,000,000, and into Enemy countries from £426,000,000 to £722,000,000. In the same period the value of the exports from the Allied countries increased from £518,000,000 to £817,000,000, from the Neutral countries from £866,000,000 to £1,528,000,000, and from Enemy countries from £364,000,000 to £583,000,000.

As percentages on the values of 1904 the international trade of the world in 1912 showed the following increases:—

Countries.	Increase of trade of 1912 as a percentage on the trade of 1904. Imports.	Exports.	Imports and exports together.
United Kingdom	35·21	61·46	45·77
British dominions and possessions	80·13	59·94	69·72
British Empire, total	51·28	60·74	55·53
Allies	77·65	57·72	67·87
Neutrals	75·22	76·44	75·97
Enemies	69·18	60·16	65·19
All foreign countries, total	74·69	67·50	71·12
All countries, total	67·05	65·58	66·34

From such figures as are available it would appear that the following percentages represented, approximately, the share of the nations in the total international trade of the world in 1904 and 1912:—

Approximate Share of the Nations in the International Trade of the World, shown as Percentages.

	1904.	1912.
Imports.		
United Kingdom	21	17
British possessions and dominions	12	13
British Empire, total	33	30
Allies	20	22
Neutrals	31	32
Enemies	16	16
All foreign countries, total	67	70
All countries, total	100	100
Exports.		
United Kingdom	15	15
British dominions and possessions	13	13
British Empire, total	28	28
Allies	21	20
Neutrals	36	38
Enemies	15	14
All foreign countries, total	72	72
All countries, total	100	100

MOTOR SHIPS OF MEDIUM TONNAGE.

Hitherto, motor propulsion has been used principally in small boats and quite large vessels, but several yards have been established in Sweden this year for the construction of motor ships of medium tonnage, such as used in North European service. It is considered that the latter offers great scope for the utilisation of motor vessels.

Two new motor-ship yards have been founded in Norrkoping. One of these, the Ostseewerk (founded by a Stockholm firm), has already commenced work and laid the keel for a motor cargo vessel of 725 tons. Owing to shortage of steel, a composite construction will be employed, viz., a wooden skin over a steel frame. This yard has two slipways, suitable for vessels up to 1,200 tons. The Norrkoping Ship and Engine Works (capital, £55,000) has laid down a yard near Norrkoping for the construction of motor cargo vessels up to 1,000 tons or so. The small Malmo yard, which has hitherto engaged only in repairs, has now been equipped for the construction of motor vessels up to 1,000 tons. Another firm founded in Stockholm with a capital of £55,000, has extended a small yard and motor works so as to be able to deal with 2,000-ton motor ships and larger ship motors. Various old-established yards have motor ships of 600 to 1,000 tons d.w. capacity under construction. Some of these are motor auxiliary vessels, but most are motor ships.

GERMAN SHIPPING AND EUROPEAN EMIGRATION—VII.

We have persistently directed attention to the importance of the rôle played by the Hapag and Norddeutscher-Lloyd in regard to emigration from Europe, and in our last article endeavoured to show that these two companies exercised absolute control over the vast volume of emigrant traffic passing through the German frontier stations—thanks to the powers conferred upon them by the Prussian Government in 1894.

We now propose to put before our readers a few details concerning the methods adopted by the steamship companies for handling passenger business generally and emigrant traffic in particular.

Confining ourselves to the North Atlantic trade we may say that for many years past the steamship companies engaged in this traffic have—principally as a protective measure—banded themselves together, either individually or in groups, to form what are known as "conferences," of which the "North Atlantic Conference" is certainly the most important. The lines forming this "conference" are the Hamburg-Amerika, Holland-Amerika (or Nasm), Norddeutscher Lloyd, Red Star, American, Cunard, White Star, Anchor and Allan (U.S. Services), and they are collectively called the "Atlantic Conference Lines." The first four are also known as the "Continental Lines" or N.D.L.V. (Nordatlantischer Dampfer-Linien Verband).

Lines other than those named may be, and are, officially recognised when admitted to the select ring of signatories to the various agreements drawn up by the Conference.

Representatives of the companies party to the conference met from time to time, and usually in Paris, London or Berlin, to discuss matters of general interest to the trade, to adjust outstanding differences, and to regulate and fix the *minimum* rates of passage money to be charged for east- and west-bound traffic by the various companies concerned. These rates (for all classes) vary according to the type of steamer engaged and also according to the season, different rates being in force for what are known as winter, intermediate and summer seasons.

A code of rules binds the several companies to the due observance of the terms of the different agreements existing between them, and penalties are exacted for a proven breach of any of the "conference rules." We are not concerned here with the details of this system as applied to any class of traffic other than emigrant, and will therefore confine our further remarks exclusively to the latter.

Emigration traffic between the North Atlantic ports is regulated by what is called

Agreement AA.

This Agreement was drawn up in London in the early part of 1908, the contract running for a period of three years, that is to say, from March 1, 1908, until February 28, 1911. It was to be renewable from year to year, unless due notice be given to the secretary not later than on December 1 of the intention to terminate the same at the end of the following February, namely, and in the first instance, on December 1, 1910.

The parties to *Agreement AA* comprise all those mentioned above, but also include the Dominion Line and Canadian Pacific (Atlantic Lines), and they jointly agree to :—

Article 1.—"Guarantee to each other percental participation, as defined and provided for in Article 3 of the contract, of the entire steerage traffic forwarded by the parties to this contract from *all* European ports to and via the United States of America and Canada, and *vice versa*, in vessels owned, leased, chartered or controlled by them without regard to the flag. Excepted are Italian and Oriental passengers forwarded by direct steamers through the Straits of Gibraltar. (Oriental passenger means passengers to or from Greece, Africa and Asia.)"*

* Passengers free from the "pool" are those landing or embarking at Gibraltar, the Azores or Madeira by steamers of direct Mediterranean lines. Non-Italian and non-Oriental passengers from or to Genoa, Naples or any other Mediterranean port must be accounted for. (By-law to Agreement AA, Jena, June 7, 1910.)

The percental proportion alluded to above is allotted as under :—

Article 3.

Line.	West-bound pro-portion.	East-bound pro-portion.
Allan (U.S. services, Glasgow)	0·62	4·65
(including Portland in winter)		
Anchor (Liverpool) ..	3·40	...
Cunard (Liverpool)	13·75 for Liverpool service ..	12·77
	for Fiume-Trieste service	2·35
Hapag (Hamburg)	19·91	12·83
Nasm (Rotterdam)	6·93	6·10
Norddeutscher Lloyd (Bremen)	26·23	18·79
Red Star (Antwerp)	9·71	8·56
White Star (*)	8·90	15·18
American (*)	6·65 ...	8·72
Dominion (*)	1·47	1·50
Canadian Pacific (Atlantic S.S. Lines)	—	4·49

(*) = International Mercantile Marine.

According to *Article* 6, any line exceeding its allotted proportion in any one year shall pay £4 compensation for each passenger (soul) carried in excess of this proportion. Such is to be paid to the line or lines who have not reached their participation quota, and in proportion to the number of steeragers which each line is short.

(The payment of compensation forms one of the main features of the contract. It furnishes the requisite means to deter the lines from following the tendency to exceed their proportion).

For the faithful performance of the conditions of the Agreement, *Article* 17 stipulates that a guarantee shall be given, each line to deposit with the Pool Secretary a promissory note for £1,000 for each per cent. proportion—only payable by award of the arbitrator. Owing to certain difficulties promissory notes were replaced later by acceptances (By-law 63).

The headquarters of the "pool" were established in Jena, and Herr H. Peters (formerly connected with one of the German companies) was appointed secretary. His salary was payable by the lines in equal parts; and he was entitled to expenses calculated in proportion to the mean of the percentages allotted to each company as provided in *Article* 3. (Under By-law 53, June 7, 1910, Herr Peters' salary was fixed at £2,000 per annum, and it was left to his discretion to apportion the expenses between the N.D.L.V. and the Atlantic Conference Lines.)

Besides Agreement AA certain minor contracts were made, as under :—

Agreement Z between the Atlantic Conference Lines (including the N.D.L.V.) and the

Allan Line (Canadian Services, including Portland in winter),
Dominion Line (including Portland in winter), and the
Donaldson Line,

to be jointly known as the "Canadian Lines." The lines concerned agreed to enter into a pool contract on Continental steerage business to and via the United States and Canada, the Canadian Lines agreeing to accept as their share 2·79 per cent. (per annum) of the traffic.

The division was established as follows :—

Dominion Line to receive	0·74	per cent.
Allan Line (Canadian service) ...	1·85	,,
Donaldson Line	0·20	,,

This contract was made in London on February 5, 1908, to run from March 1, 1908, to February 28, 1911.

Agreement CC was drawn up later between the lines parties to Agreement AA and the Canadian Northern or "Royal Line," under the terms of which the Royal Line was to receive 1·15 per cent. of the traffic.

The contract dated from September 1, 1910, to terminate February 28, 1911, but renewable yearly thereafter as with Agreement AA. (A minor contract known as the *Scandinavian Agreement* was concluded on March 3, 1910, between the International Marine, the Anchor and Cunard Lines, and the Scandinavian American Line.)

Agreement AA (*Article* 3) shows us that the N.D.L.V. (or Continental Lines) secured the bulk of the west-bound traffic, their total

percentages amounting to 62·48, the German lines together receiving 46·14 per cent. The proportion for east-bound business was 45·8 per cent., that for the German lines alone being 31·14. The Norddeutscher Lloyd was apportioned the highest percentages, namely, 26·53 and 18·79 respectively for west-bound and east-bound traffic.

We have before observed that the attitude of the German lines (and particularly of the Hapag) to their partners in the "pool" has been of an intensely aggressive character. Every opportunity was seized to make the foreign (or non-German) lines subservient to their will, not only in regard to passenger traffic but also in the matter of freight.*

The Holland-Amerika Line was for long years a thorn in the side of the Germans, and the latter adopted every possible means to force compliance with their own schemes. The introduction of the German Emigration Law of 1897 somewhat eased the position, but even so it was only through subscribing to agreements dictated by the German lines that the Holland-Amerika was enabled to maintain a certain level of independence. Within the last few years certain proposals were made by the Holland-Amerika and Red Star Lines having regard to adequate representation in German territory. The sole satisfaction obtained was that the matter was discussed at a Conference meeting held at the Hotel Adlon, Berlin, on January 29, 1913, when it was decided that "The claim of the Holland-Amerika Line and Red Star Line to maintain general agencies in Germany, at places where the German lines are not so represented, was withdrawn." In other words the claim was met with a point-blank refusal.

It must not be imagined, however, that the German lines were always successful in their endeavours to crush or weaken their opponents. A case in point is the persistent refusal of the Cyprien Fabre Line (running between Marseilles and New York) to fall in line with the views of the Mediterranean Conference. This resolute company has rejected every invitation to join the pool, preferring to maintain liberty of action. As a consequence highly aggressive measures have been employed by its opponents to weaken its position in the North Atlantic trade, but so far from attaining their object the other companies have only succeeded in rousing the Fabre Line to fresh efforts which have been undeniably crowned with success. Those who are unacquainted with the inner working of big steamship lines can have no idea of the extent to which pressure of all kinds has been brought to bear on the plucky Cie. Fabre, especially by the Hapag and Norddeutscher Lloyd.

The influence upon the world's shipping exercised by the German lines during the past two decades and more has steadily grown in intensity, and to an extent which the layman can hardly appreciate. Holding powerful weapons in their hands they have not scrupled to make the fullest use of them, completely ignoring or else trampling under foot the rights and privileges of their competitors.

A leading article appeared in (we believe) the *Vossische Zeitung* in the early summer of 1915, the writer of which took for his text—developing his argument with painstaking care and scholastic preciseness—the novel axiom that "Might is Right." Although we say "novel" it is by no means such in reality, for this same axiom has been the mainspring of the German mechanism during the last half-century—as we have found to our cost; and it has certainly been adopted as a governing principle by the German steamship companies in all their dealings with competitors. Their behaviour towards the latter was outwardly correct, but as we have said before their *real* attitude was one of constant aggression which, in the case of the Hapag, was carried to a brutal degree. Herr Ballin is a man who will brook no interference from either friend or foe, and his watch-word is plainly "any means to an end." The Norddeutscher Lloyd on the other hand has been uniformly more conciliatory, and although both companies have engaged every effort to attain the common end in view—the domination of the world's shipping industry—a marked difference is manifest. They stand united against all others, but no love is lost between the two as individual companies; and we may truly say that there is always a bone of contention waiting to be picked clean by their "pool" secretaries, both of whom are very able men possessing a knowledge of their work typically Teutonic in its thoroughness.

We often wonder what is to be the position of the German lines when the present trouble is at an end; whether in the interval of waiting the allied Governments will be able to evolve and set in motion a plan of action which shall effectively prevent the German shipping magnates from carrying into effect their oft-reiterated boasts of commercial and maritime conquest.

Will these be allowed to regain possession of the huge fleet which fled for safety to neutral ports at the outbreak of war, or is restitution to the last penny to be exacted for the wanton sinking of so many of our boats—large and small—by the dastardly submarine?

These are momentous questions, the solutions of which lie on the lap of the gods.

Many mistakes have been made in the past, and many solemn warnings have been flouted and ignored by those who should have given ear to the cry of danger. Let it then be seen to that no more mistakes be made in the future.

TALPA.

* Freight traffic also is regulated by agreements between the various lines.

STEAMSHIP APPLIANCES.

"MERKLO" ELECTRIC LAMPS.

The accompanying illustration shows the "Merklo" electric lamp, which is supplied by Archibald Low & Sons, Ltd., 28A, Renfield Street, and at Merkland Works, Partick, Glasgow.

The "Merklo" Lamp.

The lamp shown has been specially constructed for use on standardised and all other vessels. It fulfils the requirements usually wanted in connection with Admiralty work or standardised vessels. namely, a small neat bulb to fit existing fittings, of great strength, with a specially-anchored filament that will withstand the unavoidable vibration, shock, and rough usage to which ships' lamps are always subjected. The metal filaments are made of drawn wire, and are guaranteed for the same period as the lamps sold for ordinary use in the home or factory. The firm claims that it is the only lamp with a guarantee, which is as follows:—"These 'Merklo' lamps are guaranteed for three months, providing they are not used on a higher voltage than that marked on the lamps." If they fail within this period under ordinary usage, new lamps will be provided free of charge.

Swedish Imports of German Coal.—Considerably less German coal was imported into Sweden in 1917 than in 1916, the decrease commencing at the end of 1916. In February and March, 1917, the figures were 51,847 tons and 69,810 tons; and in April and May they were 90,000 tons and 170,582 tons compared with 482,585 tons and 536,095 tons in April and May, 1916, *i.e.*, a reduction of more than 75 per cent. for these two months. The average price for this coal in German ports was 79s. and 83s. 6d. in 1917, compared with 48s. in 1916. The total imports for the first five months of 1917 were 467,383 tons, compared with 2,097,598 tons for the same period in 1916—a reduction of nearly 78 per cent.

GENERAL NEWS SECTION.

PERSONAL.

Sir William J. Tatem, Bart., has contributed £1,000 towards King George's Fund, which is being raised for the aid of sailors when sick, aged, &c.

Lieut.-Colonel A. J. Scully, M.C., Northumberland Fusiliers, who received a hearty welcome on visiting Newcastle Commercial Exchange last week, has had the unique experience of having been reported killed on five occasions.

Mr. J. D. Thomas was buried at Cardiff on September 4. Deceased was the Admiralty overseer on the Staff of Commander Main, D.S.O., R.D., R.N.R., Officer-in-Charge for the Defensive Armament of Ships in South Wales.

Mr. M. J. Brierton, who has charge of the City of Dublin Steam Packet Company's passenger department in Liverpool, completed on Monday this week 50 years' service with the company. He has held his present position in Liverpool for 34 years.

There is a widespread feeling in Newcastle that Mr. George Lunn, of Lunn & Maccoy, shipowners, should consent to stand for a third year as Lord Mayor of that city. The matter will be decided at a meeting of the City Council in the first week in October.

Leave has been given by the Irish Courts to presume the death of Captain Wm. Craig, of Belfast, on June 9. Captain Craig was master of the ss. *Hamburg*, owned by J. & C. Harrison, of London, which was torpedoed 180 miles west of Ushant. Twenty-nine of the crew were saved and 11 lost.

Mr. William Patterson Ruddock, a Newcastle shipbroker and coal exporter, died recently at his residence, Solstrand, Ashfield Grove, Monkseaton. Mr. Ruddock, who was only 40 years of age, served his apprenticeship with the Moor Line, Ltd., and about five years ago commenced business on his own account, the firm being W. P. Ruddock & Co.

Mr. A. Palmer Surgey, the Shipping Manager to William Duff & Son, Ltd., after 38 years in their employ, is retiring upon a well-earned pension. Mr. Surgey, who is so well known in the Far Eastern, Australian, Indian and South African trades will be greatly missed by the various shipowners and shipbrokers with whom he has had such close business relations for so many years past, and there was no keener man in the City than he in looking after his firm's interests.

Sir George J. Carter, K.B.E., Managing Director of Cammell Laird & Co., Ltd., Birkenhead, is mentioned as likely to succeed the late Mr. J. J. Evans as a member of the Mersey Docks and Harbour Board. The vacancy is not an elective one, and must be filled by a nomination from the Mersey Conservancy Commissioners. Sir George Carter has had experience in dock administration work, inasmuch as before coming to Birkenhead he was a member of the Tyne Commissioners.

Major G. P. Denton, who was a member of the staff of Swan, Hunter & Wigham Richardson, Ltd., at their shipyard, Wallsend-on-Tyne, has had the Military Cross conferred upon him by His Majesty the King for conspicuous gallantry and devotion to duty when in command of his battery under particularly trying and severe conditions. In the midst of exploding ammunition dumps and very heavy casualties caused by hostile shell and gas-shell fire he showed splendid resource and coolness in reorganising his men and dealing with a very critical situation.

Captain B. L. Robinson, A.S.C., a Director of the Charlton Steam Shipping Company, Newcastle, has died at a sanatorium in Aberdeenshire. He was granted a commission in 1914, and after serving nearly two years in France he was invalided home.

Mr. A. Noble, Works Manager at Palmers' Hebburn Shipyard, who has secured an important appointment in the South of England, has been made the recipient of presents from the officials and foremen, and the women workers at the shipyard. There were also gifts for Mrs. and Miss Noble.

Mr. P. D. Ewing, who has acted as General Manager of the Ailsa Shipbuilding Company, Ltd., Troon and Ayr, for the past seven years, has resigned that position on being appointed Manager of the Standard Shipbuilding and Engineering Co., Ltd., Chepstow. Mr Ewing, during the time he was associated with the Ailsa Company, took a prominent place in Shipbuilding circles on the Clyde. Under his management the company had developed its operations in various directions, and he was responsible for the carrying out of many important contracts. Before leaving Troon Mr. Ewing was made the recipient of a number of gifts from the workmen and staff of the Ailsa Company. These gifts were presented recently at a gathering of the employees of the firm. Mr. A. E. Howell, who made the presentation on behalf of the subscribers, expressed the regret which they all felt at Mr. Ewing's departure. While he had no doubt, he said, that Mr. Ewing was looking forward with zest to overcoming the difficulties which would face him in his new sphere, Mr. Ewing would probably have some regrets in leaving the Clyde. In the first place he had to leave without seeing the completion of a number of vessels in which he had taken the greatest interest and on the beginning of which he had expended a great deal of time and hard work. Mr. Ewing had also to leave without seeing completed several important improvement schemes at the shipyards at Ayr and Troon. It was perhaps inevitable, however, that a man of his abilities and attainments should seek a wider sphere. They in Troon should consider themselves fortunate that they had had the benefit for so long a period as seven years of his great experience as a naval architect and of the shrewd business knowledge which Mr. Ewing brought to bear upon the business of the Ailsa Company. Mr. Ewing, in acknowledging the gifts, said that during his time in Troon many interesting vessels had been built in the yard. One and all had proved successful and had justified the confidence placed in the Ailsa Company by the shipowners. Success in shipbuilding as in many other branches of industry did not depend on one, two or three men, who might be at the head of a concern, but on the combination of officials, staff and workmen, and he ventured to say there did not exist anywhere a better combination than they had at Troon. He thanked them all for their gifts to himself, his wife and his daughters.

Mr. P. D. Ewing,
Manager, Standard Shipbuilding & Engineering Co., Ltd., Chepstow.

PORT OF LONDON AUTHORITY.

Eighth Annual Report.

The annual report of the Port of London Authority for the year ended March 31 has been published. It states that the total net tonnage of vessels which arrived and departed with cargoes and in ballast from and to foreign countries and British Possessions, and coastwise, during the year ended December 31, 1916, was 24,976,437 tons, as compared with 30,890,531 tons during the year 1915. Both totals are exclusive of the tonnage of vessels employed by the Government in connection with the war.

The net register and deck cargo tonnage of shipping which entered and left the Port of London and paid river tonnage dues during the twelve months ended March 31, 1917, and 1916, respectively, was as follows:

	1917.		1916.		Percentage decrease.
Foreign					
Inwards ...	8,208,337		9,975,855		17·7
Outwards ...	4,879,660		5,541,481		12·0
		13,087,997		15,515,336	15·6
Coastwise—					
Inwards ...	4,072,662		5,024,069		18·9
Outwards ...	1,219,553		1,742,742		30·0
		5,292,215		6,766,811	21·8
		18,380,212		22,282,167	17·5

The decrease was therefore 3,901,955 tons, of which 2,427,329 tons were in the foreign and 1,474,626 tons in the coastwise trades.

The tonnage of shipping included in the above which used the wet docks amounted to 64·2 per cent. of the total, compared with 61·1 per cent. in the twelve months preceding, and a normal proportion of 60·1 per cent., viz.:—

	1917.		1916.		Percentage decrease.
Foreign					
Inwards ...	6,453,647		7,465,323		13·6
Outwards ...	3,986,000		4,383,994		9·1
		10,439,647		11,849,317	11·9
Coastwise—					
Inwards ...	896,647		1,076,492		16·7
Outwards ...	459,655		697,070		34·1
		1,356,302		1,773,562	23·5
		11,795,949		13,622,879	13·4

The tonnage of shipping liable to dock dues which entered the wet docks was 8,101,730 tons, as compared with 9,659,516 tons for the year ended March 31, 1916, a decrease of 1,557,786 tons, or 16·1 per cent.

The shipping entering the dry docks of the Authority during the twelve months was 595,864 tons or 18·4 per cent. less than that of the previous year.

The values of the total imports and exports (excluding coastwise goods) of the United Kingdom, and six principal ports, for the year ended December 31, 1916, were as follows:—

	1916. £	1915. £	Percentage increase or decrease.
United Kingdom	1,552,352,377	1,335,823,979	+ 16·2
London (including Queenborough)	547,825,533	496,833,942	+ 10·3
Liverpool	476,185,960	393,169,056	+ 21·1
Hull	86,766,334	73,123,662	+ 18·7
Manchester (including Runcorn) ...	69,253,894	56,673,867	+ 22·2
Southampton	16,834,688	17,717,274	− 5·0
Glasgow	75,879,394	56,909,724	+ 33·3

During the twelve months ended March 31, 1917, the Authority landed or received 2,649,064 tons of import goods for warehousing or for immediate delivery, a decrease of 170,268 tons, or 6 per cent. as compared with the tonnage dealt with during the previous twelve months. The landings for warehousing have again been heavy and exceed the tonnages for all previous years except 1916, and the tonnage of goods passed directly over the quays, although less than last year, is above the average for previous years.

The stocks at the end of March, 1917, in the warehouses directly controlled by the Authority amounted to 629,292 tons, as compared with 563,495 tons at the corresponding date in 1916, an increase of 65,797 tons. The stocks in warehouse at the end of each month of the year under review have exceeded those for the previous year by 76,961 tons on average of the twelve monthly stocktakings.

The export traffic handled on the dock quays during the twelve months amounted to 867,710 tons, as compared with 872,289 tons in the previous year, a decrease of 4,579 tons.

The congestion in the port which prevailed during the greater part of the year 1915 has disappeared. The regulation by the Government of the shipment of sugar and other goods and the restriction of imports has contributed in part to this result, but the relief is principally due to the additions made by the Authority to the storage and transit facilities at the docks.

The amount of the allowances granted since the outbreak of the war to wives and children and other dependants of members of the staff serving with the Forces has reached the sum of £48,242. Seventy-two members of the staff have fallen in the service of the country during the year.

The difficulty of finding efficient substitutes, especially for clerical work, in place of those who have joined the Army has greatly increased. At March 31, 357 temporary men clerks and 308 temporary women clerks were on duty. The number of women clerks is constantly being increased.

In May, 1916, the Authority created and issued at the price of £99 per cent. £500,000 Port of London 5¼ per cent. inscribed stock redeemable at par on August 1, 1921, chiefly for the purpose of paying off temporary loans to meet capital expenditure on the improvement and development of the facilities of the Port. The stock ranks as to security *pari passu* with the 4 per cent. inscribed stock, the 3½ per cent. inscribed stock and the "B" stock already issued. The balance of borrowing powers by means of the issue of Port stock remaining unexercised at March 31, 1917, amounted to £5,556,697, as follows:—

	£
Port stock authorised to be issued	32,647,156
Port stock issued	27,090,459
Balance unissued	5,556,697

Temporary loans outstanding at March 31, 1917, against further issues of Port stock amounted to £260,000, as compared with a figure of £520,000 outstanding at March 31, 1916, representing a reduction in this item during the year of £260,000.

The capital expenditure for the year ended March 31, 1917, amounted to £464,172.

The following is a summary of the year's working:—

	Docks and river. £	Warehouses. £	Total. £
Total revenue	2,669,380	1,898,046	4,567,426
Total expenditure	1,478,556	1,308,390	2,786,946
Balance of revenue	1,190,824	589,656	1,780,480
Deduct—			
Charges for interest on Port stock, sinking funds, income tax, &c., less interest, &c., receivable...			1,159,140
Surplus revenue (subject to the undermentioned appropriations)			621,340
Add—			
Balance of revenue carried forward, March 31, 1916			232,059
Balance available			853,399
Deduct—			
Provision to meet expenditure on maintenance, dredging, &c., postponed in consequence of the war	£ 386,956		
Port of London Authority Pension Fund— Balance of Authority's contributions to date ...	25,978		
General Reserve Fund— Amount transferred under Section 22 (1) of the Port of London Act, 1908	100,000		512,934
Balance of revenue carried forward, subject to liability, if any, for Excess Profits Duty... ...			340,465

During the year under review, expenditure for the adequate maintenance and upkeep of the Authority's undertaking has again been restricted by reason of war conditions and shortage of labour, and it has been necessary further to postpone the systematic completion of the programme of special repairs. Following on a report by the Chief Engineer, a sum of £386,956 has been set aside out of this year's revenue and added to the balance unexpended carried forward from last year, making a total of £837,143 available to meet the estimated cost of arrears at March 31, 1917.

The amount standing to the credit of the general reserve fund at March 31, 1917, was £630,824. The fund has been augmented during the year by interest on investments amounting to £14,927, and by the further contribution of £100,000 from net revenue. The value of investments at mean market prices at March 31, 1917, amounted to £471,590, leaving a balance of £159,234 to be invested.

The by-laws regulating the conveyance of carbide of calcium on the river were found to be ineffective in their purpose in preventing this chemical from being placed in, as distinct from being conveyed in, unlicensed barges and an amended code has been adopted and submitted to the Board of Trade for approval.

Following upon a decision of the Board of Trade that on the strict legal question the Authority is not entitled to require owners of insulated barges themselves to incur the expense of obtaining a certificate of fitness from Lloyd's Register as an essential preliminary to registering the craft for use on the river, the Board of Trade pointed out as a means of recovering the cost of Lloyd's fees, that the Authority possesses power to raise the registration fees on the barges to the maximum of 1s. per ton, the present levy being only half that sum. By-laws to effect this have been prepared and adopted, and are now before the Board of Trade for approval.

FROM OUR CORRESPONDENTS.

CLYDE DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

New Shipyard at Dundee.—There is promise of considerable development in the shipbuilding industry at Dundee. At a meeting of Dundee Harbour Board last week it was reported that negotiations which had been carried on recently had resulted in the leasing of a piece of ground, 14 acres in extent, to the Caledon Shipbuilding Company for use as a shipyard. The Caledon Company already possess a shipbuilding establishment at Dundee, but in the new yard which they intend to lay out they will be able to construct vessels of a much larger size than in their existing yard. It is understood that in their new yard the company will be able to lay down seven building berths. It was reported some time ago that the firm have orders on hand for a number of new vessels. At the same meeting of the Dundee Harbour Board reference was made to an application which had been received from another company for ground on which to build ferro-concrete ships, but no indication was given as to whether this concern intend to proceed with their project at Dundee.

Shipbuilders and Munitions Act.—Not infrequently cases come up at the Glasgow Munitions Tribunal which have a much wider interest than that of the firms immediately concerned. A case of this kind was decided against a Clyde shipbuilding firm the other day for changing the emoluments of a class of workman without the sanction of the Minister of Munitions, and thereby contravening Section 4 (2) of the Munitions Act. The prosecution was brought at the instance of the Sheet Iron Workers' and Light Platers' Society. In finding the firm had contravened the Act and imposing a penalty of £2, the Chairman of the Tribunal said it appeared to have been the practice of the firm to pay an allowance of 1s. per day to men working one mile from the workshop. This payment was stopped by them in May last. This was clearly a change in the emoluments of sheet-iron workers in their employment. It was a leading principle of the Munitions Act that a practice of this sort was not to be interfered with during the war. The mistake the respondents had made was to assume that when they became members of the Engineering Employers' Association they were entitled then to discard their previous practice of paying the 1s., and to adopt the 6d. and mile-and-half practice of a working agreement made in October, 1907, between the North-West Engineering Trades Employers' Association and the Amalgamated Society of Engineers and other societies, but not including the Sheet Iron Workers' Society.

Harbour Schemes Postponed.—A further postponement is to be made of certain schemes for the improvement of traffic facilities at Glasgow harbour. It has been thought advisable to postpone these schemes until after the declaration of peace. Shortly before the war broke out the Corporation of Glasgow contemplated the erection of a bridge, of the opening type, across the Clyde at Finnieston Quay. This, it was anticipated would greatly facilitate the transit of goods from one side of the river to the other and especially between Prince and Queen's Docks. To proceed with an undertaking of this magnitude is, of course, quite out of the question in the midst of the great war. Another scheme, the arrangements for which were practically complete, has also been delayed. The Corporation intend to take over the ferries on the river from the Clyde Trustees and to run them free to the public. When war broke out it was decided to postpone the transference of the ferries from one body to the other till July 1, 1918, and now it is proposed to delay the matter for another year.

Safety of Shipping in Scottish Waters.—With a view to safeguarding the interests of shipping in the Pentland and Moray Firths certain regulations for the restriction of traffic have been issued by the Admiralty. A special caution warns neutral or Allied vessels that the passage through the Pentland Firth presents very grave risks to west-bound vessels, which are strongly advised not to take the passage. Pilotage is compulsory at the ports of Cromarty and Inverness on all vessels which have a draught of 8 ft. The regulations contain detailed instructions to be followed by all navigators in the areas referred to and also in the areas surrounding the Orkney and Shetland Isles.

NORTH-EAST COAST DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Transfer of Labour.—The scheme for the rapid transfer of labour from one establishment to another, as it may be desired, and for the acceleration of production in shipbuilding, as explained by Major Ronald Williams, Assistant Director of Labour Transfer under the Shipyard Labour Department (Admiralty) to meetings of shipbuilding and engineering employers and to shipyard trade unions when on a recent visit to Tyneside, is making steady progress. As already recorded in these columns, the men's representatives accepted the proposals very favourably at the outset, and since then the shipbuilding and engineering employers have met and given their support to the scheme by deciding to appoint seven representatives to form the employers' panel to confer with the men's panel of a similar number of representatives. The chairman of the Joint Committee will be the Admiralty Superintendent in the district, and there are now sanguine hopes that when this new machinery is in full operation it will give a fresh impetus to the expeditious output of tonnage. The primary aim is to promptly utilise the skill of every available man in the industry. When there is a temporary absence of work for a particular class of labour in one shipyard, it is intended to endeavour to divert it quickly to another yard where it may be urgently needed.

Requirements of British Trade.—The future organisation of commercial intelligence in this country was alluded to at the last meeting of the Newcastle Chamber of Commerce by the secretary, Mr. Herbert Shaw, who said that some little difficulty in the progress of what had been aimed at had arisen in consequence of a diversity of opinion as to whether the work should be under the direction of the Foreign Office or the Board of Trade. It had been suggested that a new Parliamentary secretary should be appointed to act in a sort of dual capacity as between the Foreign Office and the Board of Trade in the matter of organising the intelligence department to meet the requirements of British trade after the war. This suggestion he did not think was an altogether wise one, and he favoured the view that the Government might go further, and at the same time solve the difficulty by creating a Ministry of Commerce for which they had been hoping for so long. In the meantime, however, it was gratifying to the commercial world at large to know that the Government was fully alive to the necessity of looking after British trade when the war was over.

Large Shipyard Scheme.—Further interesting particulars of the important shipyard undertaking, of which Lord Furness is the chief promoter, on the Tees, were made known at the last meeting of the River Tees Conservancy Commissioners, held at Middlesbrough, under the chairmanship of Sir Hugh Bell, Bart. Mr. John H. Amos, the general manager, intimated that as a result of several meetings with Lord Furness the terms and conditions of the Commissioner of Woods and the Tees Commissioners in connection with the sale of the whole of the unsold reclaimed land at Haverton Hill had been accepted by his lordship. An actual survey, recently made, showed that the land covered an area of 52 acres with a river frontage of 1,550 lineal feet. The plot of reclaimed land was regarded as insufficient for the projected new works, and negotiations have been arranged for the sale to Lord Furness of a further site, the property of the Ecclesiastical Commissioners of about 33 acres with a frontage to the river of 940 lineal feet immediately adjacent to the reclaimed land, upon the same terms and conditions as those embodied in the sale by the Crown and Tees Commissioners. Thus the ground secured by Lord Furness for the purpose of a shipbuilding yard and drydocks and engineering works will cover a total area of 85 acres with a frontage of nearly 2,500 ft.

Women Workers' Wages.—There are now many women workers in the shipyards, ship-repairing establishments and engineering shops on the North-East coast, and negotiations have just been completed between the Northern District Executive Committee of the National Union of General Workers and the National Amalgamated Union of Labour and the North-East Coast Engineering.

Employers' Association respecting the wages of this class of labour, along with a special arbitration tribunal for the women workers in the shipyards and drydocks. The terms of settlement are set out in a rather lengthy document which affords striking testimony to the varied and useful work women and girls are adapting themselves to in these industries in war time. They are labouring to practically all the skilled trades, and in addition are doing machine work, drilling, painting and working the lighter power hammers and cranes. Their wages for an ordinary week's work of 53 hours range from 30s. to 37s. 6d.

Cost of Removing Wrecks, &c.—The Hartlepools Port and Harbour Commissioners claim the distinction of having originated the movement regarding the proposal that the cost of removing and dispersing wrecks due to the war should be borne by the Imperial Exchequer, and therefore that authority will feel gratified at the way other port authorities have taken up the suggestion. The matter is now in the hands of the Association of Harbour and Port Authorities and we shall doubtless hear more of it in the future. At the last meeting of the Hartlepool Commissioners it was reported that there was now a fair depth of water inside the piers at West Hartlepool, and that part of the channel most liable to shoal, just to the east of the piers, had been deepened to such an extent that it should be immune from any sudden shoaling for some time to come. In August the dredgers raised and sent to sea 28,000 tons of sand, &c.

MERSEY DISTRICT.

(From Our Own Correspondent.)

Floating Bridge at Seacombe.—The Wallasey Town Council have shown themselves opportunists, and with the commencement of work on the new shipbuilding yard, at Seacombe, of the Mersey Shipbuilding Company, they have promptly decided to make the long-wanted provision of a floating bridge for cross-river traffic. They have just decided to purchase from the Mersey Docks and Harbour Board a strip of land 80 ft. wide, which abuts on the new shipyard, for the purpose, and the venture is sure to prove a great convenience to the docks in the vicinity, and not less to the town and the new shipyard. The purchase price of the land is stated to be £16,350, for approximately 3,270 square yards that is required.

Designing Standard Ships.—A very eminent person here, whose name I am not at liberty to disclose, but who is, nevertheless, a great authority in shipping, has expressed to me the view that the designing of standard ships offered the Government an opportunity which they have failed to take advantage of, of experimenting with known types of ships, which, in theory, would not so readily succumb to submarine attack. And singularly enough this view seems to be held by others who are experts in ship design, who deplore that in the existing state of things some important departure has not been made in the stereotype form of hull design. Among the latter is Mr. J. J. Kermode, of liquid fuel fame, who urges that the best way to subdivide a ship to ensure her safety, would be to make each of her decks capable of carrying the ship waterborne. One can only conclude from these experts that the standard ships now building have nothing in them, as regards constructional design, that the present emergency seems to call for.

Coal Supply.—Such progress has been made in the last few months in the organisation of the Lancashire coal trade that, it will be good news to consumers, shipping among them, to learn that there is no fear of a shortage during the coming winter.

Uniform Seamen's Wages.—I learn here that there is a likelihood before long of seamen's wages being made uniform throughout the country. A scheme is being developed by the authorities in London, so it is said, which will embrace seamen, firemen, stewards, cooks, and bakers, and will apply to liners as well as to tramp ships.

SOUTH WALES DISTRICT.

(From Our Own Correspondent.)

State Control of Shipping.—At the monthly meeting of the Cardiff Chamber of Commerce an interesting discussion took place on the position of shipowners under Government control. Mr. J. C. Gould referred to the circular which he had issued to the shareholders. He stated that on five requisitioned ships they had lost altogether in six months, without taking into consideration club calls, &c., something like £14,000. He pointed out that when they had free ships running they were not allowed to put to reserve anything like the amount necessary, and they were now faced with serious losses. Shipowners had been promised relief by the Government, but it was simply a vague promise. It was a moot legal point whether they should be called upon to pay premiums in connection with requisitioned ships. According to the form of charter the Government was compelled to pay all insurances. They had no idea when running their ships as free boats up to February 20, as to the incidence of the Governme nt scheme of insurance. As matters now stood, he said, they were going to lose on free ships under the Government terms even more than on requisitioned ships. They were faced with the facts that the Governments of Great Britain and America were adopting a policy which was calculated to eliminate the shipowner all over the world. The president, Mr. T. E. Watson, said he had hoped that Mr. Gould would have provided the meeting with a few facts in regard to the present treatment of shipowners by the Government. Mr. Gould said he had refrained from doing so because he had been called upon to make an explanation as to the statements which he had already made.

Co-operation of Chambers of Commerce and Shipowners.—Mr. John Andrews, at the Cardiff Chamber of Commerce meeting, said it would be advantageous if Chambers of Commerce all over the country would pass resolutions in favour of making representations to the Government as to the unfair and unjust treatment meted out to the shipping industry. The following resolutions were adopted: "The Council is requested to work with the Shipowners' Association in placing and keeping before the public and the Authorities the true facts with regard to shipping"; and, "This Chamber, the majority of whose members are not shipowners, protests against the unfair and one-sided treatment of British shipowners by the Government."

Newport Shipbuilding Project.—Steps are being taken for the establishment of a large shipbuilding yard at Newport. The Works Committee of the Newport Corporation have received a letter from Mr. Ernest Lyne, estate agent of Lord Treowen, stating that negotiations are being entered into by a Syndicate for acquiring certain property for that purpose. The Corporation has been asked if they will agree to a right of way along the river bank through such property being stopped up, as had been done in similar cases when right of way interfered with the commercial development of the property. The Committee have asked for fuller details and are prepared to favourably consider the application. The proposed site, comprising about five acres of land, is situated on the western bank of the river Usk. The depth of water in the river for launching purposes is quite satisfactory.

The Standard Shipbuilding Company, Chepstow, have acquired the Beachley Estate, which includes the whole of the village of Beachley, for the purpose of important extensions in connection with their business.

Outward Coal Freight Rates in August.—In the following table is shown the average rates of freight paid to representative ports in August, 1916, July, 1917, and August, 1917:—

Cardiff to—	August, 1916.	July, 1917.	August, 1917
Bilbao	30/-	125/-	130/-
Brest	—	45/	45/-
Bordeaux	47·77 fr.	—	57·4
Caen	23/9	44/9½	47/2
Cherbourg	24/6	—	39/11
Dunkirk	28/6	—	45/
Gibraltar	34/3	87/6	95/-
Havre	23/-	22/6	45/9
Rouen	24/10	48/8½	46/5
Rio de Janeiro	32/6	—	125/-
St. Malo	21/-	43/6	27/1½
St. Nazaire	40·70 fr.	45/3	39/10

Trade of Swansea Harbour.—According to the official returns of the Harbour Trust, imports last month amounted to 26,837 tons, and in the past eight months to 344,654 tons, compared with 63,192 and 484,804 tons in the corresponding period last year. Exports totalled 349,686 tons and 2,372,973 tons in the same periods, and in 1916 they amounted to 411,393 and 3,262,611 tons respectively.

BELFAST DISTRICT.

(From Our Own Correspondent.)

Visits by Irish Convention.—The shipyards and engine works in Belfast were visited last week by the members of the Irish Convention, who were the guests for the afternoon of the Harbour Board, on whose steamer they made a trip of the docks. They witnessed the departure of the men from work in the evening and were impressed by the number of hands streaming out of the establishments of Harland & Wolff and Workman, Clark & Co. The

yards and shops continue very busy, overtime being still plentiful, but Sunday labour has been reduced almost to the minimum point. The recent trials of a standard ship, at which Lord Pirrie was present, were of great interest to Belfast, inasmuch as it is no secret that the vessel was built on the Logan. Good progress is being made with other standard ships on order. Important developments in connection with these ships have taken place recently which will make Belfast a still more important centre as far as this class of work is concerned.

Navigation of Carlingford Lough.—A deputation from the Carlingford Lough Commission waited last week on the Irish Board of Lights, to discuss the question of providing electrical communication between Haulbowline Lighthouse and Greenore. The Board of Trade inquiry into the loss of the L. & N. W. Rly. Co.'s steamer *Connemara* revealed the necessity for great improvement in this respect, and the Court submitted several recommendations, one of which related to the communication between the lighthouse and the shore. The Irish Lights Board will deal with the matter at its next full meeting. The question of introducing the block system for the navigation of the "Cut," where the disaster occurred, has been discussed, but the Carlingford Commissioners are not in favour of it. The Royal National Lifeboat Institution has withdrawn its lifeboat from Greenore. A number of actions against the Clanrye S.S. Co., Newry, owners of the ss. *Retriever*, which sank the *Connemara*, have been remitted by the Irish Courts to the Sheriff of Down for assessment of damages.

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.—The firm tone of the freight market is maintained, though the amount of business transacted on the Baltic Exchange has not been large. The Eastern and North American Atlantic seaboard sections of the market continue to exercise pressure for tonnage, but the amount available is limited and competition for neutral vessels is keen. The River Plate section of the market is inactive and rates are largely nominal at 145s. from the up river ports, or 5s. less for down river loading. From the Northern Range charterers are anxious to find tonnage on net form of charter for which 200s. is offered to the United Kingdom and 250s. to the French Bay ports, an additional 30s. being forthcoming for Gulf loading. To Italy 325s. would be paid. Heavy grain would come at 30s. and oats 25s. Coal cargoes offer from Virginia to the Plate at 125s. or $32 to Rio de Janeiro. Nitrate can be done at 220s. to West Italy. There is no lack of inquiry from the East. Karachi offers 250s. on scale basis to the United Kingdom. On deadweight Bombay also offers 250s. to the United Kingdom or 400s. to the Mediterranean. The Madras Coast continues to offer the high rate of 500s. for kernels to Marseilles. From the rice ports up to 500s. can be had from Burmah to this country and Saigon would pay the same rate to France. In the Mediterranean section of the market good business continues to be done from the ore and phosphate ports, on the basis of 45s. Huelva to the Mersey, 50 frs. Bilbao to Boulogne, 50s. Bougie to the Clyde, and 70s. Sfax to Cork, while for pyrites 60s. can be had from Huelva to the East Coast United Kingdom. A keen demand exists for neutral vessels on time charter, and a handy-sized vessel has been fixed at 49s. for 12 months United Kingdom, France and Mediterranean trade. For cotton, rates have been fixed by the authorities at 500 cents per 100 lb. from the Northern Range to Liverpool and Manchester. An additional 100 cents is payable from any port in Carolina or Georgia. Gulf loading is 25 cents additional.

Glasgow.—There has been practically no change in the condition of affairs on the Glasgow market since our last report. Chartering has been inactive and there has been little free tonnage available. Even in the limitation trades boats came forward very slowly. Rates were easily maintained at full maximum figures. There was little of fresh interest to report in the homeward markets, America being the only quarter displaying an interest in quotations. A fixture was reported: Virginia to the River Plate, about 80s., coal, September-October. Eastern and River Plate markets were neglected for want of tonnage.

Newcastle-on-Tyne.—Whilst the collieries have been fairly well supplied with tonnage wherein to despatch contract quantities and requisitioned supplies on official account, there has not been a great deal of "free" shipping available for private exporters. However, chartering in respect of the more distant ports has been rather more active, a small mercy for which merchants are correspondingly grateful. Thus, Gothenburg has been twice fixed for 2,400 tons and 1,900 tons at the full rate of 200 kr. Barcelona has been done, for a 4,500-ton vessel, at 215s. Gibraltar has been arranged for, for a 5,000-ton steamer, at 97s. 6d. from the Tyne, whilst a 6,500-ton boat has been fixed for the destination from Blyth or Hull at the record rate of 100s. The inquiry for vessels from these farther ports continues brisk. Portugal is still based on 90s. to Lisbon and 100s. to Oporto. Port Said continues quoted at 165s. The Swedish demand is quieter, although the recently-paid rate of 207½ kr. to Stockholm could probably be repeated. Coasting business has been done at from 19s. to 20s. to London, rates which mark a smart advance on the week. The local committee has had very few boats before it from allocation to French Atlantic ports with coal and/or coke, although the demand for such transport facilities has undergone no abatement.

Liverpool.—There is no new feature to record on this market, except it be that coal shipments to neutral destinations are paying higher rates where tonnage can be obtained. Generally, outward business is limited to the small amount of free tonnage offering, and in these circumstances rates all round keep firm. Time chartering is subject to the same conditions, and firm rates fail to attract tonnage. An occasional fixture is made in the home trades, but these give little indication of current values. Suitable boats are, however, scarce for chartering in the long distance trades. Homeward freights are much in the same position as a week ago. Eastern markets cannot get on even at the high rates indicated, and consequently no fixtures can be recorded. Mediterranean ore ports are able to do good business at current rates with available tonnage, but here again business is restricted to tonnage in sight. North America has still an active demand for net charters, at 200s. from Northern ports to Liverpool, 250s. to French Atlantic, and 350s. to West Italy. Nitrate ports have need of tonnage, but the response so far is only limited.

Cardiff and Swansea.—There has been very little activity on the outward coal freight market. The paucity of business is accounted for by the lack of tonnage. The position in this respect shows but little change from past weeks. Rates quoted for neutral ports have ruled steady. Spanish destinations ruling at about 140s. for Bilbao and 220s. for Barcelona. Business for France reported includes: Brest, 45s. (neutral); St. Malo, 21s. (Allied) and 45s. (neutral); Granville, 48s. (neutral); and Rouen three times at 48s. 9d. (neutral); Bordeaux, 34s. (Allied); La Pallice, 61s. 6d. (neutral). On the Swansea market conditions show no change. There has been a brisk inquiry and previous quotations have been firmly maintained. The following fixtures were reported, Brest, 46s. 6d. (neutral); Caen, 46s. 6d. (neutral) while the following were for Port Talbot loading: Rouen, 25s. 3d. (Allied); 49s. 6d., fuel (neutral); and Bordeaux, 69s. (neutral).

Hull.—The market has a firm tone with a very strong demand for tonnage, especially for North French destinations and also for West Italian ports. There is a good trade passing to France at limitation rates wherever tonnage is available. The neutral markets are quiet owing to lack of tonnage.

PORT NOTES.

Lindarangen.—The Stockholm municipality has decided to establish a large free port at Lindarangen. The cost is estimated at £1,030,000 if the State gives the site. Work may be commenced on the construction during the next year.

Lourenço Marques.—In order to make provision for the expected development of the meat export trade, a big improvement of the handling facilities at Lourenço Marques has been decided upon. At present there is keen rivalry between the port and Beira for this traffic, but the advantage is held by Delagoa Bay.

Honolulu.—Preparations are under way for the reception and bunkering of an increased number of freight steamers at Honolulu following advices received by shipping representation that that port will be made a base of supplies for at least three new lines of cargo steamers to ply between the west coast of America and Japanese and Siberian ports. Improved facilities have brought Honolulu to a commanding position for coaling and ballasting or for discharging or trimming cargo. More dock space is now available owing to the closing of the harbour to a number of German refugee steamers, which have been taken away to be repaired. Efforts are now being made to protect the port against a possible shortage of bunker coal.

COMPANY REPORTS AND DIVIDENDS.

Deutsche Dampffischerei Gesellschaft, Bremen.—A dividend of 14 per cent. is recommended, compared with 12 per cent. last year.

Norddeutsche Hochseefischerei A.G., Geestemunde.—A dividend of 20 per cent. (20 per cent.) is recommended from the net profit of £16,500 (£12,600).

Cressington Steamship Company, Ltd.—The directors have declared an interim dividend for the six months ended June 30 last, at the rate of 6 per cent. per annum, as compared with 16 per cent. a year ago.

Visurgis Fischerei A.G., Bremen.—A dividend of 4 per cent. (nil) is recommended, and it is proposed to increase the capital from £56,200 to £88,000 in order to acquire the motor fleet of the Brema Company.

Orient Company, Copenhagen.—This company realised a gross profit of £856,000 (£341,000) on £550,000 share capital during the year ending June 30, 1917. A dividend of 65 per cent. (25 per cent.) has been paid.

Hamburg Cuxhaven A.G., "Alte Liebe."—A dividend of 10 per cent. has been accepted from a net profit of £19,250 (£3,990). Prospects for the coming year are uncertain owing to the war. Richard Hempell and Otto Matthiessen are elected to the council.

Helsingor Schiffbau u. Maschinenfabrik A.G., Helsingor.—The surplus for 1916-17 was £137,500 (£69,100). After transferring £29,000 to reserve and £47,000 (£16,600) to management fund, a dividend of 25 per cent. (30 per cent.) is available.

Hochseefischerei J. Wieting A.G., Bremerhaven.—The fleet was used principally for other than normal purposes. Allowing £3,990 (£4,340) for depreciation, there remains £12,150 (£9,800) net profit, distributed as follows:—Reserve £608 (£490), bonuses, &c. £621 (£487), 13 per cent. (10 per cent.) dividend £9,540 (£7,340), carried forward £1,360 (£1,480).

Geestemunde Hochseefischerei A.G.—The report for 1916-17 says that the capital increase from £36,750 to £49,000, decided upon during the year, has been accomplished. The fleet was fully occupied in one way or another on favourable terms. Considerable sums (not yet known) have been allowed for depreciation and allotted to reserve, to cover the cost of refitting the fleet after the war. A dividend of 5 per cent. is paid from the net profit of £12,700 (£2,145).

Braker Heringsfischerei A.G.—Part of the fleet was engaged in fishing; the remaining vessels were otherwise employed. After deducting business expenses £5,700 (£4,630), and depreciation £4,640 (£6,080), there remains a net profit of £6,860 (£3,110). A dividend of 10 per cent. (5 per cent.) is paid on the share capital of £49,000; £1,560 (£487) is carried forward, and the balance is transferred to reserve. Prospects are equally favourable for the current year.

Leerer Heringsfischerei A.G., Leer.—This company is not in a happy position. It is true that "by adapting operation to present conditions and selling superfluous material" last year's deficit has been wiped out (£8,790), and 4 per cent. dividend is to be paid. Nevertheless, the loss of the *Margaretha* has been a serious blow; the company's relations with the Nederlandschen Schiepshypothekbank (Rotterdam) have not yet been settled, and nothing can be said concerning prospects for the present year.

Blohm & Voss, Komm. Gesell., Hamburg.—The total capital was raised to £980,000 during the year 1916-17 and 5½ per cent. dividend has been declared on the Preference shares, and 6 per cent. on the Foundation shares. The balance sheet shows floating docks, buildings, slipways, cranes and engines, &c., £2,190,000 (£2,120,000); ships, &c., under construction, £4,050,000 (£3,010,000); stock in hand, £570,000 (£379,000); bills, £340,000 (£149,000); debtors, bank cash, £248,000 (£241,000); securities, £185,000 (£93,000). On the other side:—Foundation shares, £490,000 (£295,000); Preference shares, £490,000 (£295,000); privilege loan, £344,000 (£359,000); payments on ships under construction, £5,300,000 (£4,360,000); creditors, £604,000 (£475,000); statutory reserve, £78,400 (£58,900); special reserve, £20,600 (£16,200); profit on Foundation and Preference shares, £56,200 (£33,900); compensation, £23,900 (£17,300); profit carried forward, £3,350 (£2,800). The profit and loss account shows:—Balance brought forward, £2,800 (£2,025); gross profit after deducting business expenses, £410,000 (£296,000). On the other side, interest on privilege loan, £15,100 (£15,800); insurance £6,090 (£5,220); sickness and accident insurance, &c., £31,000 (£25,600); war grants, £84,700 (£51,000); depreciation, &c., £158,000 (£126,000); net profit, £116,500 (£75,000).

COMPANY REGISTRATIONS.

Ynyslas Colliery Co., Ltd.—Capital, £10,000, in £1 shares. Objects: To take over the Ynysavon Colliery, Cwmavon. Agreement with Ynysavon (1916) Colliery Co., Ltd. Signatories:—

G. R. Lewis, Dulias House, Aberdulais, nr. Neath, colliery proprietor.
J. Davies, Central Stores, Resolven, colliery proprietor.

The first directors are G. R. Lewis and J. Davies. Solicitor, W. A. Leyson, 2, Church Place, Neath. Private company.

Cremyll Shipping Co., Ltd.—Capital, £1,000, in £1 shares. Objects: Shipowners, managers, and managing owners, ships' husbands, &c. Signatories:—

A. M. Ingledew, 4, Mount Stuart Square, Cardiff, solicitor.
A. D. Greatrex, 97-8, Bute Street, Cardiff.

The first directors are to be appointed by the subscribers. Solicitors, Ingledew & Sons, Cardiff. Private company.

Vaalbank (Transvaal) Colliery, Ltd.—Capital, £500, in 5s. shares. Objects: To take over the business of the African Freehold Coal Lands, Ltd. Signatories:—

A. Knopwood, Park Mount, Meynick Park Crescent, Bournemouth, merchant.
R. W. Mitchell, 791, Salisbury House, E.C. 2.
W. J. Thompson, 26, Wormwood Street, E.C., company director.
W. C. Hall, 26, Wormwood Street, E.C.
G. Morgan, 35, Penge Road, South Norwood, S.E., company secretary.
H. Prickett, 790, Salisbury House, E.C., accountant.
Alma G. West, 25, Dinsmore Road, Balham, S.W., clerk.

The first directors are to be appointed by the subscribers. Solicitors, Kennedy, Linds & Co., 13-14, Abchurch Lane, E.C. Private company.

Harperley Park Coal Co., Ltd.—Capital, £7,000, in £1 shares. Objects: To take over the business of colliery proprietors carried on at Middlesbrough as the Harperley Park Coal Company. Signatories:—

W. G. Urwin, Beechwood, Saltburn, merchant.
M. Dunn, Ivanhoe, Appleton Road, Stockton-on-Tees.
H. D. Parsons, Lorne Terrace, Stockton-on-Tees, chartered secretary.

The first directors are H. D. Parsons, M. Dunn, and W. G. Urwin. Solicitor, R. W. Smith, 21, Albert Road, Middlesbrough. Private company.

Packers, Ltd.—Capital, £3,000, in £1 shares. Objects: Transport agents, packers, &c. Signatories:—

A. Reynolds, Bigwood House, Hampstead Suburb, N.W. 4, wharfinger and carrier.
F. A. Reynolds, 9, Willow Road, Hampstead Heath, N.W. 3, carrier and wharfinger.

The first directors are A. Reynolds, E. J. Reynolds, and F. A. Reynolds. Registered office, 65, New Broad Street, E.C. 2. Private company.

Edward Challinor, Ltd.—Capital, £5,000, in £1 shares. Objects: Merchants, importers, exporters, shipowners, ship and insurance brokers, managers of shipping property, freight contractors, carriers by land and sea, wharfingers, warehousemen, ice merchants, refrigerating storekeepers, &c. Signatories:—

E. Challinor, 12, Westbourne Road, Birkdale, merchant.
Mrs. A. E. Challinor, 12, Westbourne Road, Birkdale.
A. Wilcock, Saddlebole Farm, The Hough, Alderley Edge, manager.

Directors to be appointed by the shareholders. Secretaries, James Dutton & Son, Bolton. Private company.

Engineering Components, Ltd.—Capital, £7,500, in 5,000 ordinary and 2,500 7 per cent. preference shares of £1 each. Objects: To take over the business of manufacturing engineers carried on by W. H. Reynolds, Ltd., at Reno Works, Rosslyn Crescent, Wealdstone, and to carry on the business of marine, electrical, mechanical and motor engineers' manufacturers, watercraft of all kinds, and manufacturers of and dealers in watercraft of all kinds. Signatories:—

Miss M. E. Hardiman, 25, Tachbrook Road, Southall, Middlesex.
Miss O. N. Brooks, Kildare, Fairview Estate, Hockley, Essex.

The first directors are to be appointed by the subscribers. Registered office, Reno Works, Rosslyn Crescent, Wealdstone. Private company.

NEWS PARAGRAPHS.

New Italian Steamship Company.—A circular has been issued announcing the constitution of the "Transoceanica" Società Italiana di Navigazione.

Submarines for Spain.—An Exchange telegram states that the cruiser *Estramadura* will shortly convey to Spain several submarines constructed for the Government at Genoese shipyards.

Unfair Treatment of British Shipowners.—The Cardiff Chamber of Commerce have passed a resolution protesting against the unfair treatment meted out to British shipowners by the Government.

Norwegian Insurance.—According to Norwegian law, the personal property of Norwegian seamen on vessels going through blockade zones must be insured as follows:—Captain, £55; first mate and chief engineer, £33; second mate and second engineer, £27 10s.; steward, £27 10s.; other members of crew, £22 each.

Medals and Diplomas for Rescuing Crew.—The Board of Trade have received through the Foreign Office a silver medal and diploma for W. Hutchinson, master of the tug *Dora Duncan*, of Middlesbrough, and bronze medals and diplomas for F. Ransom and W. Tinmouth, mates, J. McLeod, engineer, and G. Wardropper and F. Bruce, firemen. These awards have been made by the President of the French Republic, in recognition of their services in rescuing the shipwrecked crew of a French steamship in the North Sea in September, 1916.

Indian Vessels for Mine Sweeping.—An Order in Council published in the *London Gazette* in announcing that the Government of India has agreed to place at the disposal of the Naval Commander-in-Chief on the East Indies Station the *General Elles*, *Investigator*, *Elephanta*, and certain other vessels in His Majesty's Indian Marine Service, provides that such vessels and the men and officers shall be under the command of the Senior Naval Officer of the station where for the time being such ships may be. The vessels are to be employed in mine-sweeping, patrol, and other auxiliary duties.

Concrete Shipbuilding at San Francisco.—According to *Engineering News Record*, a group of San Francisco capitalists have combined to finance a $200,000 scheme for constructing ocean-going vessels of concrete. Work is to start at once in a shipyard laid out for the purpose on San Francisco Bay, near Redwood City. The type of concrete vessel will be about 300 ft. long, with a cargo capacity of 4,500 tons. The shell of the hull is to be about 6 in. thick, made of the best concrete reinforced with steel rods welded together. The weight of the hull is to be less than the weight of a wooden hull for the same cargo capacity. About 90 days will be required to build the first vessel.

British Cargo Steamship Services.—According to the *Board of Trade Journal*, the Department of Commercial Intelligence is prepared, on application, to furnish available information regarding British cargo steamship services trading between the United Kingdom and all ports of the world. Applicants for information are requested to state their requirements clearly, particularly indicating the ports or districts between which cargo is to be carried. Information regarding British forwarding agencies from the United Kingdom to all parts of the world may also be obtained on application to the Department of Commercial Intelligence. Firms requiring information are requested to give full details, especially in regard to the ports or districts between which goods are to be carried.

Compulsory Pilotage in Bristol Channel.—Instructions set out in an Admiralty Notice to Mariners, published in the *London Gazette*, on September 7, regarding pilotage in the Bristol Channel, have now been made compulsory. All alien vessels navigating in the waters of the Bristol Channel to the northward and eastward of a line drawn from Pwll-du Head to the Scarweather Lightvessel, and thence to Sker (Scar) Point, must be conducted by pilots licensed by either the Swansea Harbour Trustees or the Port Talbot Pilotage Board. All alien vessels navigating in the waters of the Bristol Channel to the eastward of a line drawn from Branksea Point to Watchet must be conducted by pilots licensed by either the London Trinity House, the Barry Pilotage Board, the Cardiff Pilotage Board, the Newport Pilotage Board, the Corporation of Bristol, or the Gloucester Pilotage Board.

Officers of the Merchant Service Interned in Enemy Countries.—The Government having made the requisite financial provisions through the medium of the Netherlands Government, it is evident from information which is reaching the Imperial Merchant Service Guild that the Germans are transferring a large number of merchant captains and officers taken captive by enemy submarines and hitherto interned in ordinary internment camps, to officers' internment camps where there is much more comfort and the surroundings are more congenial. Communications received by the Guild from merchant captains at Salzerbad, Austria, and also at the Magnesie Camp, Turkey, in acknowledging receipt of parcels and monetary remittances from the Guild, state that all the British seafarers interned in these camps are in the best of health and spirits, though longing for the time when they may return to their homes once more.

Lloyd Italico, Genoa.—An insurance and re-insurance company with this title and a share capital of about £1,000,000 has been founded by the Societa Nazionale Navigazione and the house of Ansaldo.

Union-Castle Company at Beira.—Important business premises, on one of the best sites in Beira, and with a frontage of over 100 ft. to the principal street, have been bought by the Union-Castle Company for £4,000.

Navigazione Generale Italiana.—Part of the war profits have been applied to raising the nominal value of shares from £11 18s. to £19 17s. In addition, £795,000 worth of new shares have been raised so that the total share capital has been raised from £2,390,000 to £4,770,000.

Schwedische Lloyd.—By acquiring a majority of shares in the Nordiska Reederei, the Lloyd has added five steamships (3,600 tons total) to the fleet at its disposal. During 1916, the company acquired all the shares of the Goteborg-Manchester line and of the Thule and Svithiod firms. The total fleet of the Lloyd now amounts to 46 steamships of 86,000 tons d.w. capacity.

Dutch Hold on Rhine Shipping.—The Duisburg Chamber of Commerce has lately conducted a statistical investigation into the extent to which German Rhine shipping is mortgaged to Dutch banks. The details of the investigation are regarded as confidential, but it is announced that the relative indebtedness of German shipping and owners to Dutch banks has been much increased during the war. In order that German owners may be able to liquidate their liabilities and increase their independence after the war, a German shipping bank should be established and devoted specifically to Rhine shipping interests. Such a bank would be of great benefit to German shipbuilders and industry in general.

Trade with Morocco.—The *Board of Trade Journal* publishes a report from the Acting British Vice-Consul at Laraiche, Morocco. Prior to the war, British trade with Morocco was seriously hampered by the inadequate shipping facilities between the United Kingdom and Morocco. This handicap was taken full advantage of by Germany, the increase of whose trade with Morocco in recent years was in great part due to the very frequent, punctual and regular steamship service between the ports of Hamburg, Rotterdam and Antwerp, and Morocco, which was instituted by the Oldenburg Portugiesische Dampfschiff Gesellschaft of Hamburg. If the United Kingdom is to maintain and increase its trade with Morocco, a frequent and efficient steamship service between the two countries must be established by a company which will make a point of studying requests put forward by the merchants of various Moroccan ports. The methods of the Oldenburg Line might well be studied, and, if and when necessary, improved upon. The report contains a list of the chief articles imported to Morocco during 1913 and 1914 from Germany and Austria.

Industrial Developments on Tees-side.—It was reported recently that the East Coast Steel Corporation, Ltd., had acquired a considerable site on which it was proposed to erect blast furnaces, &c., to act as feeders of raw materials to the ship-plate manufacturing department of the South Durham Steel & Iron Co., Ltd. It is now stated that Lord Furness has acquired 85 acres of land on Tees-side, in the neighbourhood of Haverton Hill, with a river frontage of 830 yards, which site it is proposed to lay out as a shipyard, dry docks and engineering works, including the provision of berths for the construction of vessels of considerable tonnage. The site consists of 52 acres of land reclaimed by the Tees Conservancy Commissioners and 33 acres immediately adjoining, which Lord Furness has acquired from the Ecclesiastical Commissioners. The Tees Commissioners' sale leaves them without any further sites, excepting a small plot at Seaton, to sell. The chairman (Sir Hugh Bell) is of opinion, however, that all reclaimable land has not yet been secured, but that, as far as he can see, the remainder will be entirely on the north bank of the river.

Cargo Handling at Sunderland.—The River Wear Commissioners have installed a suction plant and grain elevator at the South Docks, by means of which discharging operations are being carried on at a rate never equalled in pre-war times. For example, the discharge of one large grain cargo was performed at the rate of 740 tons per day, with a maximum discharge in one day of 1,007 tons. Another vessel, with a cargo of grain and flour, was emptied at the rate of 850 tons daily, with a discharge of 1,040 tons in one day. Iron ore is discharged by means of grabs, which have proved very successful, coping with 430 tons in 8½ hours and with 1,550 tons in the double shift when both grabs and tubs were used.

Norwegian Freight Receipts.—Recent official statistics show the freight receipts of Norwegian shipping to have been £26,100,000 in 1915, compared with £11,650,000 in 1914 and £12,700,000 in the good year 1913. The 1915 receipts were thus more than twice as great as in the best previous year. The distribution of receipts between the principal ports was as follows :—

	Net tonnage of fleet.	Receipts. Line. £	Tramp. £
Bergen	328,734	5,110,000	1,840,000
Christiania	308,575	6,120,000	1,175,000
Tonsberg	155,179	1,090,000	958,000
Drontheim	31,903	1,035,000	25,400
Haugesund	92,823	810,000	710,000

Under line traffic is included service in time charter. Specially good receipts were obtained where ships were principally in line service (*e.g.*, Christiania and Drontheim). With a smaller merchant tonnage, Christiania realised higher freight receipts than Bergen. Sailing vessels contributed £39,750 to the total receipts of Bergen and £168,000 in Christiania. The receipts in Tonsberg were very low in proportion to the tonnage, which consisted largely of sailing vessels.

Transmission of Documents otherwise than by Post.—The Home Secretary has issued an Order exempting the following from Regulation 24 (which prohibits non-postal communications to or from the United Kingdom without lawful authority) of the Defence of the Realm Regulations : (1) Any document conveyed in a sealed bag for or on behalf of the British Foreign Office or any British or foreign Embassy or Legation ; (2) Any letter, message, or memorandum or any printed or written matter (including plans, photographs, and other pictorial representations) conveyed for or on behalf of any Government Department, or the Government of any of His Majesty's Dominions, or the Government of any Allied State by an accredited representative ; (3) Any shipping document from a shipping company or business firm, provided that such document (*a*) relates to the cargo or charter of the vessel on which it is conveyed ; (*b*) is placed for conveyance in the ship's box ; (*c*) is handed over on demand in an open cover for inspection to any competent naval or military authority or any person authorised by him to any aliens officer or officer of police, unless it can be shown that it has already been examined and passed by an officer of the postal censorship.

Italian Shipping Combine.—The *Times* states that particulars received in this country show that the new Italian steamship company, the Transoceanica, represents a fusion of several of the leading Italian shipping companies. Mr. George Pierce, of Pierce Bros., managers of the Sicula Americana Line, is to be president. The board also includes Messrs. Brunelli and Biancardi, joint general managers of the Navigazione Generale Italiana, and Senator Rossi Martini, a director of the Navigazione Generale Italiana. These directors are also on the board of the Lloyd Italiano, La Veloce, and Italia steamship lines. Messrs. William Pierce and Argurio directors of the Sicula Americana are also on the board. The manager of the new company is to be Mr. Ferrari, hitherto manager of the Italia Steamship Company. The Navigazione Generale Italiana owns some 18 fine steamers of between 3,000 tons and 22,000 tons gross, and maintains mail, passenger, and cargo services between Italy and North and South America. It was originally a combination of the old Florio and Rubattino lines. The Lloyd Italiano also trades to North and South America and owns some seven fine twin-screw steamers of between 5,000 and 9,000 tons gross. La Veloce, which also serves North and South America, owns several fine twin-screw steamers of somewhat similar size, and the Italia Company several steamers of between 4,000 and 9,000 gross. Besides trading to North and South America, it serves the West Indies. Several fine ships have been built in this country during recent years for the Sicula Americana. This strong combination will be an important factor in North Atlantic shipping after the war.

Indemnity of £80,000.—The owner of the torpedoed Argentine vessel *Oriana* has asked the Minister for Foreign Affairs to demand from Germany an indemnity of £80,000.

Istituto Nazionale di Industria e Commercio.—This company has been formed in Rome with a share capital of £119,000, to undertake the sale and purchase of ships, and all transactions associated therewith. The company will also buy and sell industrial concerns and sites.

Schleppschiffahrtsgesell. Unterweser, Bremen.—The statutes are to be altered so that in future no one may belong to the board or directorate who is not a subject of the State of Bremen and resident in Bremen. Also, shareholders must be unanimous before the company can be dissolved or moved from Bremen.

Large Shipbuilding Orders.—Port Arthur (Ontario) Shipbuilding Company have received orders for the building of ships to the value of £400,000, in addition to the large contracts already signed for. This will keep them working to augmented capacity until far into 1919, winter and summer alike.

Archangel Shipping Season.—Intending shippers to Archangel are officially reminded of the early closing of the Archangel shipping season. Applications for space should reach the Transportation Department, Russian Government Committee, Empire House, Kingsway, London, W.C. 2, not later than September 15, after which date applications cannot be considered.

Construction of Wooden Sailing Ships.—A company under the title of Chantiers et Ateliers de Saint Malo has been formed for the construction of wooden sailing vessels of from 500 to 3,000 tons. These vessels will be constructed entirely of hardwood, and be fitted with Diesel motor engines giving a speed of from 8 to 10 knots. The head office of the society will be at 1, Place des Petits-Pères, Paris.

Construction of Sailing Ships in Madagascar.—A Decree, promulgated in the *Journal Officiel de Madagascar*, temporarily suspends (under conditions to prevent abuse, which are laid down in the Decree) the Customs duties and the Consumption taxes on copper sheathing and nails, sailcloth, hawsers, anchors, and chains employed in the construction and equipment of sailing vessels built in the shipyards of the Colony of Madagascar and its Dependencies.

Coal for St. John and Halifax.—It is reported from Ottawa that in the Dominion House of Commons Sir George Foster informed the Hon. William Pugsley that arrangements had been made by the Fuel Controller for the shipment by water of coal supplies from New York to St. John and Halifax. Some difficulty was being experienced, however, in connection with the finding of harbour accommodation for the large vessels to be utilised. This difficulty was being inquired into by the port authorities at St. John and Halifax.

New Steamship Offices at Wellington, N.Z.—H.M. Trade Commissioner in New Zealand (Mr. R. W. Dalton) reports that a contract was recently placed for the construction of new offices at Wellington for the New Zealand Shipping Company and the Cunard Steamship Company. The building will be of considerable size, and is to be constructed on modern lines ; it is estimated that it will cost about £50,000. Work was to begin at once, but, owing to the difficulty in obtaining building material and other hindrances, operations for the present will be limited to preparatory work.

Lights on the Mississippi.—For many years the great river steamers have plied the length of the Mississippi guided only by oil lanterns hung from wooden posts. The bulk of the commerce carried on may be indicated from the fact that nearly 4,000 vessels, carrying incoming and outgoing cargoes, estimated at $300,000,000, enter the harbour of New Orleans yearly. Congress has now appropriated $50,000 to provide for 22 acetylene gas lantern lighthouses on the Mississippi below the great cotton port. The new lights will be mounted on skeleton steel towers about 30 ft. high, set on concrete foundations.

Japan's Commercial Expansion.—Mr. A. W. Burchard, vice-president of the General Electric Company, who recently returned to the United States from a three months' visit to Japan, states that Japan has become extremely prosperous since the outbreak of the war, and is fast expanding commercially in manufacturing, and particularly in the shipping industry. Merchant steamers have sold as high as $350 per ton, and the rates from Yokohama to San Francisco have increased 800 per cent. Shipbuilding is very active, existing yards having been extended and new yards of large capacity built. The foreign trade of Japan for 1917 will probably amount to $1,250,000,000, with an export balance of $250,000,000.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Ballater, ss. (single dk.) (ex *Blairmore*)	2,286 gr. 1,456 net 3,450 d.w.	313′ × 38½′ × 22½′ (20′ 5″)	Underwood Shipping Co., Cardiff, to Haenton S.S. Co., Cardiff	Harland & Wolff, Ltd., Belfast (1894)	23, 38, 62 × 42 (Muir & Houston, Glasgow)	—
Baltzar von Platen, ss. (single dk.)	724 gr. 410 net	186½′ × 28½′ × 14½′	Rederi Aktieb. Baltzar, Helsingborg, to buyers not stated	Cole Bros., Newcastle (1872)	22, 42 × 33 (Ouseburn Eng. Wks., Gateshead)	Price about 600,000 kr.
Begona No. 1, ss. (pt. awning dk.) (ex *Karistinakis*, ex *Verbena*)	2,347 gr. 1,493 net 3,700 d.w.	293′ × 41′ × 17½′ (19′ 4″)	Cia de Nav. Begona, Monte Video, to H. R. Jones, London	Furness, Withy & Co., W. Hartlepool (1895)	22, 35½, 59 × 39 (T. Richardson & Sons, Hartlepool)	—
Eibergen, ss. (single dk.)	4,751 gr. 2,965 net	385′ × 52′ × 27′	Furness Shipping & Agency Ltd., Rotterdam, to Furness, Withy & Co., Liverpool	W. Pickersgill & Sons, Sunderland (1914)	25, 40, 68 × 48 (Richardsons, Westgarth & Co., Sunderland)	—
Glenrazan, ss. (shelter dk.)	4,044 gr. 2,561 net 7,400 d.w.	370½′ × 51½′ × 24½′ (24′ 1″)	Liverpool Shipping Co., Liverpool, to Moss S.S. Co., Liverpool	Antwerp Eng. Co., Hoboken (1913)	25, 41, 68 × 48 (G. Clark, Ltd., Sunderland)	Price about £275,000.
Dalrazan, ss. (shelter dk.)	3,392 gr. 2,072 net 6,200 d.w.	365′ × 48½′ × 21½′ (22′ 1″)	Liverpool Shipping Co., Liverpool, to Moss S.S. Co., Liverpool	Richardson, Duck & Co., Stockton (1910)	25, 41, 67 × 45 (Blair & Co., Stockton)	
Kilkenny, ss. ..	1,361 gr. 576 net 750 d.w.	269½′ × 36½′ × 16¼′ (15′ 9″)	City of Dublin Steam Packet Co., Dublin, to Great Eastern Railway, London	Clyde S. B. & E. Co., Pt. Glasgow (1903)	26, 43, 69 × 42 (Clyde S.B. & E. Co.)	—
Nichiyo Maru, ss. (spar dk.)	3,357 gr. 2,109 net	330½′ × 48′ × 15¾′ (21′ 6″)	Okazaki Kisen Goshi Kaisha, Dairen, to Mr. K. Kusakabe	Russell & Co., Pt. Glasgow (1900)	24, 40½, 65 × 42 (J. G. Kincaid & Co., Greenock)	Price about 3,250,000 yen.
Nissho Maru, ss. (single dk.) (ex *Hermes*)	1,479 gr. 917 net	243½′ × 36′ × 18′	Okazaki Kisen Kabushiki Kaisha, Kobe, to Mr. Noguchi	Wood, Skinner & Co., Newcastle (1896)	18½, 30, 49½ × 33 (N.E. Marine Co., Newcastle)	Price about 1,250,000 yen.
Sarpedon, ss. ..	4,393 gr. 2,799 net	391½′ × 47½′ × 26′	Nederlandsche Stoomv. Maats. Oceaan, Amsterdam, to L. D. Holt, Liverpool	Workman, Clark & Co., Belfast (1894)	25, 42, 68½ × 54 (Workman, Clark & Co.)	—
Veenbergen, ss. (ex *Evesham*, ex *Albiana*)	4,281 gr. 2,758 net 7,386 d.w.	360½′ × 47½′ × 28′ (24′ 9″)	N.V. Furness Scheepen Argentuur-Maats., Rotterdam, to Furness, Withy & Co., Liverpool	Northumberland S.B. Co., Ltd., Newcastle (1905)	25, 41, 69 × 49 (Westgarth & Co., Ltd., Sunderland)	—
Veghstroom, ss. (single dk.)	1,339 gr. 819 net	230′ × 33′ × 17½′	Nederlandsche Stoomvaart Maatschappy "Oceaan," Amsterdam, to L. D. Holt, Liverpool	Rijkee & Co., Rotterdam (1902)	17, 28, 45 × 36 (Maats. Feyenoord, Rotterdam)	—
Whinhill, ss. (single dk.)	478 gr. 194 net 570 d.w.	165½′ × 25½′ × 9¾′ (12′ 3″)	C. R. Davidson & Co., Aberdeen, to buyers not stated	Hall, Russell & Co., Aberdeen (1914)	12, 20, 34 × 23 (Hall, Russell & Co.)	—

Neutral Shipping in U.S. Ports.—The Washington correspondent of the *Times* states that in order to increase transatlantic tonnage and to meet the growing requirements of the American forces in Europe the United States Government contemplates the seizure of over 400,000 tons of neutral shipping now lying in American ports. Since the Export Control Act has been enforced many Dutch and Scandinavian vessels laden with foodstuffs and fodder have not been allowed to leave, and the owners of the cargoes have refused to unload. The United States Government has already seized the Austrian ships which took refuge in American ports when war broke out, and it is being strongly urged by Army and Navy experts to commandeer neutrals' ships on the ground that the emergency of war requires it. The Shipping Board has decided to confine new contracts to the construction of large and fast steel vessels. Wooden vessels already contracted for will be used in the coastwise trade to release steel ships for the transatlantic service.

Japanese Shipowners and Business Tax.—A dispute is reported between the Japanese taxation authorities and shipowners in Kobe and Osaka regarding the basis of the business tax. The authorities take the view that as all transactions in vessels are by deadweight tonnage the basis for appraising the business tax should also be the deadweight instead of the gross tonnage, as hitherto. Further, while last year the value of vessels was fixed at 50 yen per ton in appraising taxes, this estimate, the authorities maintain, is too low and should be raised to about 200 yen this year. *Shipping Illustrated* (New York) states that shipowners hold there is no reason why the appraisement should be raised from 50 yen to 200 yen, seeing that the market value per ton is now rather lower than last year. When gross tonnage is converted into deadweight tonnage, the tonnage increases by about 50 per cent., so that even if the same standard of taxation is adhered to, the tax will increase by about 50 per cent. when imposed according to deadweight tonnage. If shipowners are to be taxed according to the standard contemplated by the taxation authorities, the appraisement per ton will work out at 300 yen.

NEW INSURANCE SCHEME ALTERATIONS.

The following alterations and additions have been made to time rates on free ships, according to a circular letter issued by A. Bilbrough & Co., Ltd. :—

(1) London and the Channel Islands	4½ per cent. for 91 days.
(2) Goole and the Channel Islands	4½ per cent. for 91 days.
(3) French Mediterranean to Port Said	8 per cent.
(4) The Orkney and Shetland Islands come within the limits of coasting round Great Britain	—
(5) Middlesbrough to Gibraltar, thence to Huelva, thence to Savannah, thence via Panama to West Coast of South America and back to France	20 per cent.
(6) A steamer warranted trading on Canadian coast or ports with possible trip or trips as far South as Boston, Mass.	3 per cent. for 91 days.
(7) Vessels trading between Plymouth and Channel Islands may have permission to proceed to St. Brieux	4 per cent. for 91 days.
(8) A ballast voyage from Italy to loading port in Spain	2 per cent.
(9) Bordeaux to Bayonne, thence to Dunkirk, thence to Newcastle-on-Tyne	6 per cent.
(10) Lancashire to South Ireland, Cornwall, Plymouth and Channel Islands	4½ per cent. for 91 days.
(11) Any port to any port on West Coast of South America	½ per cent. for voyage. 2 per cent. for 91 days.
(12) Glasgow via Dakar to Chili, thence to France (outside Mediterranean)	17 per cent.
(13) Glasgow to Bordeaux, thence to Bilbao, thence to Cannes, thence to the United Kingdom ...	20 per cent.
(14) A ballast voyage from Lisbon to African Mediterranean coast not east of Algiers	7 per cent.
(15) A ballast voyage from Lisbon to African Mediterranean coast east of Algiers	8 per cent.
(16) St. Maio to Swansea, thence to Pasages via Bordeaux, returning to London, Bristol, or Mersey	19 per cent.

Rate No. 7, quoted in the previous circular should read 3¼ per cent. for 91 days, not 4½ per cent. for 91 days.

SHIPPING SHARE MARKET.

In the shipping share market there has been less activity than for some time past, and there has been a noticeably thin attendance in the market. This is not unusual during the months of August and September, when the volume of orders from the investing public invariably shows a falling off. Prices of the leading shares are well maintained, and there is a tendency on the part of some provincial centres to put higher in value Furness Withy, Cairn Line, Court Line, Khedivial Mail, and some of the lower-priced shares. Without being unduly pessimistic, however, it may be noted that the best market opinion takes the view that shipping shares have reached top level for the time being, that there may be a slight fall in prices if the dividends show any tendency to come down, but that after peace is declared and tonnage is released by the Government there will be a further sharp upward movement. This is the market view, and may be taken for what it is worth. Meanwhile the speculative operator is finding scope for his activities in some of the kindred markets, such as shipbuilding and coal companies' shares. The recent operations in explosives companies' shares met with so much success that it is said the same group of operators propose to turn their attention to coal shares, in which there has been exceptional activity on both the Cardiff and Glasgow markets during the past week. Shipbuilding and engineering companies' shares are attracting the attention of the investor who is seeking a six per cent. investment with the prospect of an advance in capital values. Hawthorn Leslies have risen to £20 on the rumour that the shares are to be split. Palmers have not been so much sought after as usual, and the price is weaker, but Richardsons Westgarth, Swan & Hunters and other active shares have advanced in price. Wilsons and Clyde coal shares have risen on the probability of another bonus. All industrial undertakings having even the most remote interest in the steel industry are being bought by investors who anticipate a great revival in the iron, coal and steel industries after the war. The buying of marine insurance companies' shares is not quite so prominent, but there is a ready absorption of any shares which come on the market. The heavy liability attaching to most of these shares is, however, a useful deterrent against weak speculative operations.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	33—23⅜	10	6¾	29	
Allan Line ... ... Deb.	100	—	4	4⅜	92	
Anchor Line ... Cum. pref.	10	9⅞—9¼	5⅜	5¾	9¼	
Do. ... ... Deb.	Stk.	105½—102⅜	4⅜	4⅜	102	
Argentine Nav. ... Cum. pref.	1	19/6—11/-	Nil.	Nil.	24/-	
Do. ... ... Ord.	1	14/6—5/6	Nil.	Nil.	19/6	
Australasian Un. S. Nav. Deb.	Stk.	83⅜—80⅜	4	5⅛	78	
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & African Nav. Deb.	Stk.	96½—91	4⅜	4⅜	102	
British India Nav. ... Deb.	Stk.	94¼—88½	4½	5⅜	83	
British S.S. Invest. Trust Def.	Stk.	357—190	30*	8½	350	
Do. ... ... Pref.	Stk.	108—105⅛	6	6	101xd	
Do. ... ... Deb.	Stk.	79—77⅛	4⅜	6¼	74	
Cairn Line ... ... Deb.	Bds.	99—88	5	5⅜	90½—91	
Do. ... ... Ord.	1	—	20†	9⅜	40.9	
Clan Line ... ... Ord.	10	32½—22½	25	9⅜	29	
Court Line ... ... Ord.	£1	42/—26/-	20	12	30/-	—1/-
Cunard SS. ... ... Ord.	1	101/—68/-	20*	5½	72/-	
Do. ... Cum. pref.	Stk.	95—89	5	5⅜	85¼	
Do. ... ... Deb.	Stk.	99½—93¼	4½	4⅜	96	
Elder Line ... ... Deb.	Stk.	97¼—89⅜	4⅜	4⅜	103	
Elder Dempster ... Cum. pref.	1	20/6—18/1⅜	5⅜	5¾	18/6	+ -/6
Do. ... ... Deb.	Stk.	92½—88⅜	5	5¾	86½	+1¼
Ellerman Lines ... Pref. Ord.	10	9⅛—9½	6¾	6¾	8¾	
Do. ... Guar. pref.	10	9⅞—8¾	4⅜	5½	8½	
France Fenwick ... Cum. pref.	5	98/5—92/6	5⅜	6½	90/-	
Furness, Withy ... Ord.	1	61/3—34/3	20*	9⅜	46/3	— -/6
Do. ... Cum. pref.	10	9¼—7⅜	5	6¾	8¾	
General Steam Nav. ... Ord.	7⅜	12⅜—8½	15	7⅜	22/6	
Do. ... ... Pref.	8	7½—6⅜	6	7⅜	16/-	
Houlder Line ... Cum. pref.	5	83/9—67/6	5½	7½	77/6	
Do. ... ... Deb.	Stk.	—	4⅜	4⅜	93	
Houlder Bros. ... Cum. pref.	5	—	5⅜	5⅜	4	
Do. ... ... Deb.	Stk.	—	4⅜	5⅜	82	
India Gen. Nav. & Rly. ... Ord.	10	12—8⅜	6	5⅜	10⅜	
Indo-China N. ... Pref. Ord.	5	5 7/16—90/-	6	6¾	90/-	
Irrawaddy Flotilla	40	—	15	5 3/16	116	
Khedivial Mail ... ... Ord.	1	37/—10/-	25	13½	35/-	
Do. ... ... Pref.	5	77/6—60/6	5½	7½	75/-	
Do. ... ... Deb.	Stk.	94¾—87¼	4⅜	4⅜	95	
King Line ... ... Ord.	1	—	16*	9⅜	37	
Lamport & Holt ... Cum. pref.	£1	20/9—18/9	6	6	19/6	
Leyland (F.) ... Cum. pref.	10	8½—6⅛	5	6¾	7½	
Mercantile SS. ... ... Ord.	5	18⅜—12	40	13	15	
Do. ... ... Pref.	1	20/1⅜—20/-	5	6¼	16/3	
Moor Line ... ... Ord.	10	—	30	13	24½	
Nelson Steam Nav. ... Deb.	100	98¾—97⅜	5	5⅛	98½	
New Zealand ... ... Ord.	£10	—	8	2½	32¼	
Do. ... ... Deb.	Stk.	90¾—88	4	4⅜	86	
Nitrate Producers SS. ... Ord.	5	25¾—18	30	6¼	24⅜	
Do. ... Cum. pref.	5	—	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	99—95⅜	4⅜	4⅜	96	
Orient.Stm.Nav.Co. Cum. pref.	10	9¾—9 1/16	5	5⅜	9	
Do. ... ... Deb.	100	98—91½	4⅜	5⅛	89	
P. & O. S. N. ... Cum. pref.	100	100—91	5	5⅛	92	+2
Do. ... ... Def.	100	349—270	18	5⅜	318⅜	—1½
Do. ... ... Deb.	Stk.	71—69	3½	5⅜	63¾	
Prince Line	1	95/—26/-	30	8⅜	82/6	—5/-
R.M.S.P. ... ... Ord.	100	134⅜—97¾	7	6¼	112	
Do. ... ... Pref.	Stk.	86¾—76⅜	5	6⅛	81	
Do. ... ... Deb.	Stk.	89—86	4⅜	5⅜	85	
Shaw, Savill & Alb. Cum. pref.	5	95/—86/3	5½	5⅞	85/-	
Shell Transport ... ... Ord.	1	6—4⅜	35	5⅜	5⅜	
Do. ... Cum. pref.	10	10⅛—9	5	5⅜	9⅜	
Sutherland SS. Co.	£1	69/6—41/6	30	10	52/-	
Union-Castle SS. Cum. pref.	10	7⅛—7	4⅜	5	7⅛	
Do. ... ... Deb.	Stk.	92⅜—86⅜	4	4⅛	87⅛	
West Hartlepool ... ... Pref.	10	8¼—7½	5⅜	7⅛	7⅜	

INSURANCE.

Alliance	20 (2·4 pd.)	10½—8⅜	12/-	7	11⅜	+1⅛
Indem. Mutual Marine	15 (3 pd.)	13½—9⅛	15/-	5	20⅜	
London Assurance	25 (12½ pd.)	52⅜—42½	20	6	57	
Marine Insurance	25 (15 pd.)	36⅜—33⅜	45/-	6	56¼	— ¼
Merchants' Marine Insurance ...	10 (2½ pd.)	7⅛—71/3	10	6	9⅜	
N. British & Mercantile Ord.	25 (6¼ pd.)	34⅜—29	40/-	6⅜	35⅜	
Phœnix Assurance	10 (1 pd.)	7⅜—5⅞	40	7	7½	— 1/16
Reliance Marine	10 (2 pd.)	—	20	4⅜	7¾	
Royal Exchange Assurance ...	Stk.	189⅜—181	10	5½	225	+6
Sea Insurance	10 (2 pd.)	19⅜—19⅛	10	6	27 5/16	— 1/16
World Marine, Limited ...	5 (2 pd.)	61/3—35/-	5	4⅜	6¼	

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	64/6-47/10⅜	15	5	63/3	+1/3
Baldwins ... Cum. pref.	1	1⅜—1	5⅜	5⅜	20/-	
Do. ... ... Deb.	Stk.	87⅜—86½	4⅜	5⅜	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7¼	1 1/16	
Bell Bros. ... ... Cum. pref.	10	10 5/16—9 5/16	6	6½	9¾	
Do. ... ... Deb.	Stk.	80—78⅜	5	6⅜	75⅜	
Bessemer (Henry) ... Ord.	1	29/—26/-	12⅛	12	25/3	
Bolckow Vaughan ... Ord.	1	25/10⅜-18/-	11	9⅛	27/4½	+-/10½
Do. ... ... Cum. pref.	20	19—18	5	5⅜	16xd	
Cargo Fleet Iron ... ... Ord.	1	23/3-13/10⅜	3	3⅜	22/-	+-/10½
Do. ... ... Deb.	100	86½—84	4⅜	5⅜	82	
Consett Iron Co. ... ... Ord.	1	89/4⅜—65/3	50	11⅜	88/6xd	
Dominion Iron & Steel	Bds.	83—78	5	6⅜	79¼	
Dorman, Long ... ... Ord.	1	36/*—22/3	14	9	39/6	
Do. ... ... Deb.	Stk.	97½—97	4	5¼	73	
Ebbw Vale Steel & Iron Ord.	1	28/7⅜—19/-	12⅜	9⅜	28/6	— -/3
Guest, Keen & Nttefids Ord.	1	71/3—60/-	15*	3⅜	77/6	—2/-
Do. ... ... Cum. pref.	5	5⅜—5⅛	5	4⅜	5¼	
Do. ... ... Deb.	Stk.	82⅜—80⅛	4	5⅛	79⅛	
Hadfield's Steel Foundry Ord.	1	82/6—69/-	30	6¾	91/-	
Ibbotson Bros.	5 (4 pd.)	8—6	7⅛	4⅜	6¼	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	9—8	15*	7⅜	8¼	
Lanarkshire Steel Cum. pref.	10	—	5	7⅜	7	
Lysaght (J.) ... Cum. pref.	1	22/7⅜—20/3	6	6	20/-	
Do. ... ... 2nd pref.	1	21/1⅜—21/-	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	1 1/16	
Do. ... ... Cum. pref.	1	—	6	8	¾	
North-Eastern Steel ... Deb.	Stk.	—	4⅛	—	—	
Palmers Ship & Iron "A"	1	12/6—9/-	Nil.	Nil.	9/9	
Scott (Walter) ... ... Ord.	1	26/3—17/9	15	10⅜	27/6	
Do. ... ... Pref.	1	16/10⅜—16/3	6	7⅜	16/3	
Sheffield Forge ... ... Ord.	1	—	15	6⅜	53/6	
Shelton Iron & Steel ... Ord.	1	20/4⅛—15/-	7⅛	8½	21/-	+ -/7½
Do ... ... Deb.	100	94—92⅛	5	5½	91½	
S. Durham Steel & Iron Ord.	1	37/6—27/-	10	6⅜	36/6	+1/3
Do. ... ... Cum. pref.	1	21/—19/-	6	6⅛	20/-	
Do. ... ... Deb.	Stk.	82—80	4⅛	5⅜	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	12/1/-	
Stewarts & Lloyds Pref. ord.	10	18⅛—17	10	5½	15⅜	
Do. ... ... Cum. pref.	10	—	6	4⅜	13⅛	
Stone (J.) ... ... Cum. pref.	10	—	5	6½	8	
United States Steel ... Ord.	100$	144¾—83⅛	8	6¼	116 1/16	
Do. ... ... Cum. pref.	100$	128⅛—112½	7	5¾	124 1/16	
Vickers Ltd. ... ... Ord.	1	40/3—33/6	12⅛	7⅜	38/-	— -/1½
Do. ... ... Pref.	Stk.	93—85	5	6	84	
Do. ... ... Deb.	Stk.	83—75	4	5 1/16	77⅜	
Weardale Steel ... Def. ord.	1	31/—19/1⅛	19⅛	13⅜	28/10½	+ -/4½
Do. ... ... Cum. pref.	1	23/6—17/6	6	5	25/-	
Do. ... ... Deb.	Stk.	70⅛—69½	4	6	63	
Workington Iron & Steel Ord.	1	24/3—14/3	10	7⅜	27/1⅛	

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	43/—34/6	12⅛	7	39/7½	+ -/4⅜
Do. ... ... Cum. pref.	5	75/—67/6	4	5⅜	70/-	
Do. ... ... Deb.	Stk.	80¼—75	5	6⅜	75⅛	— ⅛
Beardmore (W.) ... ... Deb.	100	99—92	4⅜	5	91	
Brown (John) ... ... Ord.	1 (15s. pd.)	27/3—20/6	12⅛	8⅛	26/4½	— -/1½
Do. ... ... Cum. pref.	10	10—5⅜	5	5⅞	8⅜	
Cammell Laird ... ... Ord.	5	7—98/-	10	8	6 1/16	
Do. ... ... Cum. pref.	5	88/—76/3	5	6⅜	85/7½	+3/1½
Do. ... ... Deb.	100	93⅛—85	4⅜	5⅜	81	
Dunlop (Jas.) ... ... Ord.	1	19/7½-13/4½	10	10⅜	19/-	
Do. ... ... Cum. pref.	1	17/1½-16/4⅜	6	7⅛	17/6	
Fairfield Shipbldg Cum. pref.	10	8⅜—8 5/16	6	7⅜	8⅛	
Fleming & Ferguson ... Ord.	10	—	10	7	14¾	
Gray (Wm.) ... ... Deb.	100	100⅜—99¼	4⅛	½	100⅜	
Hawthorn (R. & W.) Leslie Ord.	10	15⅜—14	12⅜	8	15¾	
Henderson (D. & W.) Cum. pref.	1	—	5	8 7/16	1 1/16	
Richardsons Westgarth Ord.	1	7/9—2/10⅛	Nil.	Nil.	6/6	
Do. ... ... Cum. pref	1	15/7⅛—8/-	Nil.	Nil.	16/3	+ 2/1½
Do. ... ... Deb.	Stk.	69—67¼	4⅜	6¼	63	
Simons (W.) ... Cum. pref.	10	—	5	5	9 1/16	
Swan, Hunter & W. R. ... Ord.	1	35/6—26/-	12⅛	6½	41/-	
Do. ... ... Cum. pref.	1	18/9—17/-	5	5⅜	17/6	
Do. ... ... Deb.	Stk.	82—80⅜	4⅛	5⅜	78	
Thornycroft (John I.) ... Ord.	1	38/9—21/9	17⅜	9⅜	37/3	—1/3
Do. ... ... Cum. pref	1	18/6—16/3	6	6⅜	17/6	
Do. ... ... Deb.	100	95⅜—88	5	5⅜	84⅛	
Wallsend Slipway ... Ord.	1	2—1⅜	10	5	2	
Do. ... ... Cum. pref.	1	1—1	5	5	1	

* Including bonus. † Also 20 % in shares. ‡ Treasury price.

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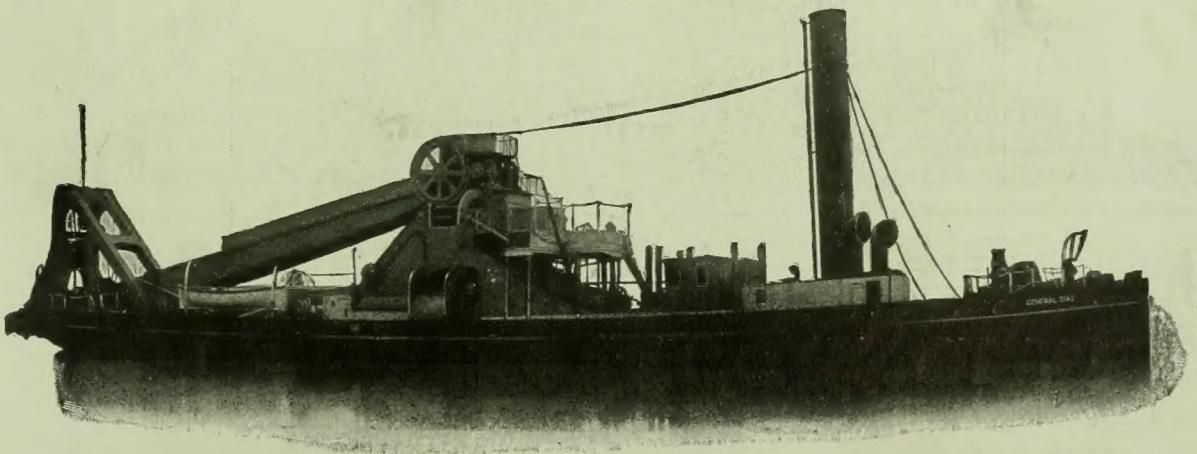

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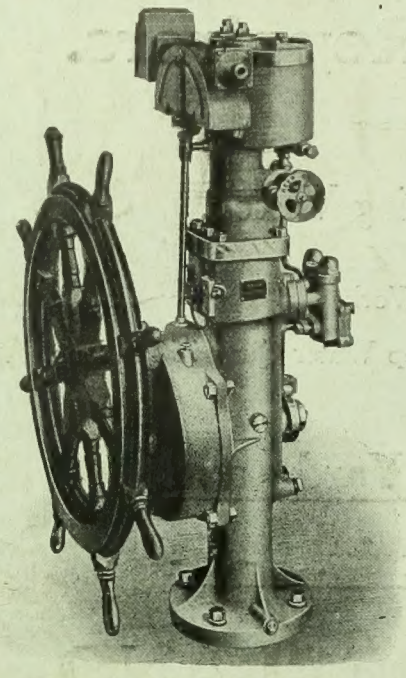

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